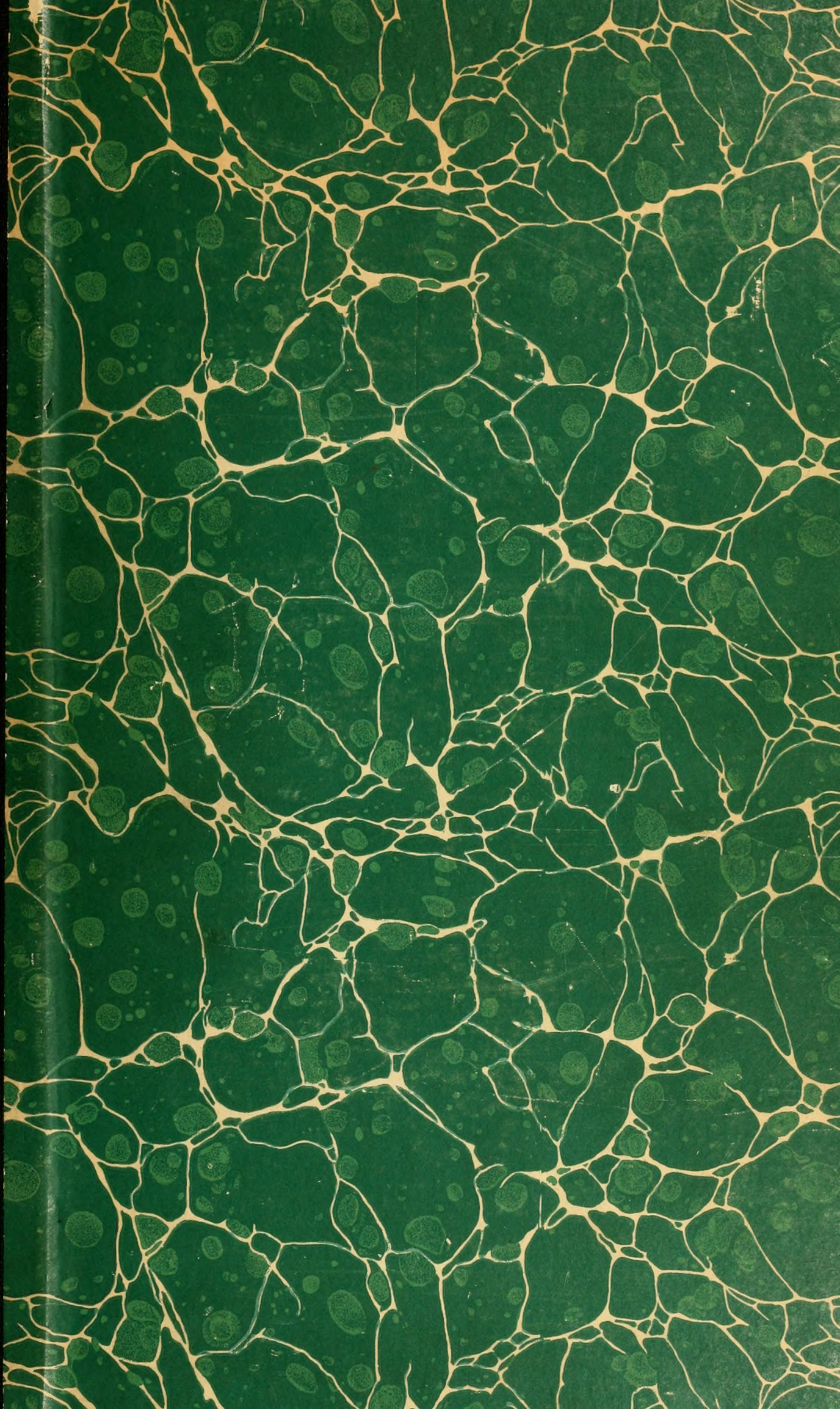
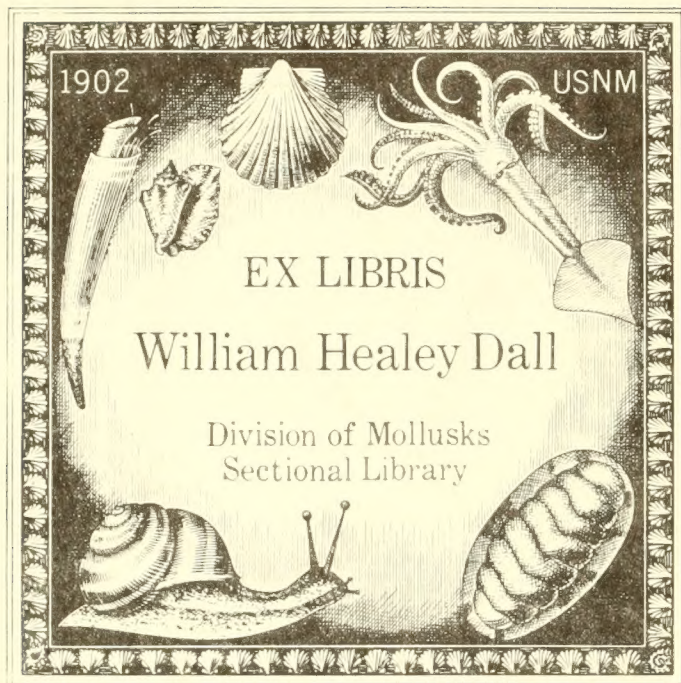






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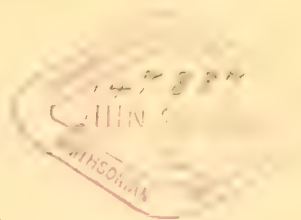
BY

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WITH AN ATLAS OF PLATES.

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INTRODUCTION.

THE following work was undertaken under many disadvantages. The writer did not accompany the Expedition, and, of course, had not an opportunity of observing specimens in their native localities, and in their natural relations. Circumstances relating to food, habits, uses, numbers, and grouping, and other important points which would impress themselves upon the mind of an observer, and by which the dry details of specific description might be greatly relieved, must, therefore, be wanting here.

Mr. Joseph P. Couthouy, the able naturalist of the Expedition in this department, made careful and suggestive notes of all interesting species, and, especially, of the new or doubtful species, with the intention of amplifying them after his return. To him they would have spoken volumes; but he alone could fully understand their import. Up to the time of leaving the Paumotu, or Low Coral Islands, these notes were pretty fully written out in form. On arriving at the Samoa Islands, his health obliged him to separate from the squadron; and the numerous notes he had subsequently made from day to day were left in an imperfect state. Still, these would have been extremely valuable, especially those relating to the land-shells of the Society, Samoa, and Sandwich Islands. But, unfortunately, repeated searches have failed to discover them among the masses of documents pertaining to the Expedition.

Mr. Couthouy was also careful to attach marks, or numbers, to all

specimens described or figured, or to which special interest attached; and they were so disposed of as to be easily accessible and readily recognised. The drawings relating to them had been so far finished as to secure the forms and attitudes, more particularly the colours of the animals, all of which greatly change after death, leaving the more permanent features to be copied at leisure. The identification of these shells was, therefore, very important. But it had been thought necessary, by the Navy Department, that the boxes sent home in advance of the Expedition should be opened, lest, by long packing, the specimens might be injured. Those who performed this service were not fully aware of the importance of replacing the specimens as originally arranged, and hence much labour and difficulty in identifying them. In many instances, the search was quite fruitless, and, consequently, many drawings and descriptions were altogether rejected, and so far lost.

Still an additional difficulty arose from residing at a long distance from Washington, where the collection is deposited, rendering it impossible to have such a frequent recourse to the specimens as would have greatly facilitated the settlement of questions which arose from day to day.

Notwithstanding the disadvantages under which this branch of Zoology laboured, an immense mass of specimens of shells was collected, and among them a very large number of new species,—larger, probably, than has ever been collected by any similar Expedition. Both before and after the separation of Mr. Couthouy, a very decided zeal, in the collection of shells, was manifested by both officers and men, as well as by the other members of the Scientific Corps. Among them must be especially mentioned, as the principal collectors:—Commander Charles Wilkes; Messrs. J. P. Couthouy, C. Pickering, J. D. Brackenridge, T. R. Peale, W. Rich, J. D. Dana, of the Scientific Corps; J. Drayton, Artist; Lieutenants C. Ringgold, A. L. Case, T. A. Budd, W. M. Walker, J. A. Underwood; Passed-Midshipmen W. May, W. Reynolds, H. Eld; Midshipmen G. W. Hammersley, and George Elliott, Jr.; Assistant-Surgeons J. L. Fox and J. S.

Whittle; W. Spieden, Purser; J. R. Howison, Captain's Clerk; F. Monserrat, Steward; C. Erskine, James Sheaf, S. Stearns, E. Verry, Seamen; J. W. W. Dyes, Taxidermist.

The Expedition was also indebted, for many specimens of rare and valuable shells, to Mr. Dimond, of the Sandwich Island Mission; Mrs. Richards, of the same Mission; and Mrs. Mitchill, of New South Wales.

With rare exceptions, the shells were collected on the sea-beach and coral reefs, very few opportunities having been afforded for obtaining specimens from deep water, by the dredge, on account of the incessant employment of the men and boats on special hydrographical duties.

Several zoological provinces not previously explored were examined, and furnished most interesting groups of specimens. Among them are the collections made at Tierra del Fuego; the land-shells of the Society and Samoa Islands, as well as other Pacific islands; and the marine shells of Oregon,—more especially those from Puget's Sound, every one of which appear to be new to collections.

In some genera the number of new species added is quite remarkable; for instance, the species added to the genus *Succinea* equal all those previously known. The genera *Trochus*, *Perna*, *Avicula*, and *Mytilus* have been greatly augmented. To the scanty list of naked mollusks previously known, additions of many new and beautiful forms have been made. The Cephalopods, especially, have received large accessions, which, for life-like colouring and delineation, have not been surpassed.

My instructions were, to name and describe the new species of shells found in the collection, following the system of Lamarck, and, also, to introduce the figures of such animals as had not hitherto been published, or had been but imperfectly delineated, with descriptions of their external features. The figures were all drawn from the living animal, so that they are true to life as to their form and colouring,—more so, indeed, than any that have yet been published. The mollusks of several genera of shells, hitherto unknown, are now, for the first time, delineated, and are important additions to malacology.

In drawing up the descriptions, I have endeavoured to use language as simple and definite as possible, and, by comparing each species with the one most nearly allied to it, to make its peculiar character apparent. Where a shell bore characters somewhat prominent, I have endeavoured to select a specific name significant of them, almost entirely avoiding local and complimentary appellations. I have retained names selected by Mr. Couthouy, unless they had been preoccupied; and, where his descriptions have mainly been used, his initials are appended; the revision of them, and the determination that they did not relate to shells already described, having been made by myself.

After the most scrupulous endeavours to avoid describing shells which had been previously named, consulting all the books and the best collections in the country, with this view, it is quite likely that the evil has not been entirely avoided. The history of a contemporaneous Voyage of Exploration in nearly the same track, has been in the course of publication simultaneously; and, from a recent examination of a few of the plates of the Voyage of the *Astrolabe* and *Zélée*, several species appear to be there figured, which are also described in this work. It is believed, however, that the descriptions published in the Proceedings of the Boston Society of Natural History were of prior date, and must, therefore, be adopted.

The formation of new genera from characters of the shell alone, has been avoided. In some few instances, where new forms of mollusks have been presented, such as could not be united with received genera without violence, a new genus has been instituted. In instances where generic divisions seemed justifiable, I have rested contented with indicating groups, without formally establishing them. In several cases it has been possible to present, for the first time, or essentially to correct, the characters of the mollusk, thus contributing something towards a natural classification.

In this collection of descriptions of new species, where so many genera do not appear at all, and very few are fairly represented, no accurate systematic arrangement could be expected, and none has been attempted.

It is much to be regretted, however, that the descriptions of animals were limited to their external characters, and that dissections and delineations of their anatomical structure had not also been directed; especially in the case of those genera in which the structure of the soft parts is still unknown. A very large supply of mollusks, in spirit, is preserved in the collection, and would afford ample materials for future zoological investigations concerning this class of animals.

As this work was intended to be purely descriptive, no generalizations were expected. A few points, however, have presented themselves so obviously, in examining the specimens and memoranda of the shell collection, that it would seem proper to advert to them.

The doctrine of distinct zoological regions evidently appertains to the mollusks, and is well illustrated by them. In nearly every work, containing any considerable catalogue of shells, the same species will be found quoted as being found in widely distant regions, in different oceans, and even on opposite sides of the globe. The many thousand localities carefully noted on the records of the Expedition, go to prove beyond dispute, that no such random or wide-spread distribution obtains. The error has arisen from two principal causes. One is, that reliable notes of localities have not been taken. A voyage is made to the Sandwich Islands, and all the shells brought home by the vessel are said to be shells from the Sandwich Islands, though they may have been obtained at California, the Society Islands, New Zealand, and, perhaps, half a dozen other places quite as remote from each other. A sea captain purchases a collection at Calcutta or Valparaiso, for his friends at home; and all the shells are marked as denizens of the port where they were purchased, though they might not have lived within thousands of miles. Purchased shells cannot be relied on for localities; for this end a shell must have been found containing the animal, or else dredged, or picked up on the shore, and labelled accordingly. There have been instances where New England shells, which had gone to the west coast of America, in the way of exchange, came back again as Pacific shells.

The second cause is, that shells are regarded as specifically iden-

tical, which, on careful comparison, are found not to be so. And this is very likely to occur, where some one very remarkable peculiarity exists. Thus, a *Lutraria* from Lower California (*L. undulata*), has the thin, milk-white, concentrically undulated valves, so similar to those which characterize a shell from the coast of Carolina (*L. canaliculata*), that no one observing them separately, would hesitate to pronounce them the same; but place the two side by side, and it will be seen that in one the beaks are near the posterior, and in the other near the anterior end of the shell. Equally striking resemblances and differences will be found when we compare *Macra nasuta* and *M. Brasiliana*, *Lutraria ventricosa* and *L. carinata*, the former of which are found in the Gulf of California, and their analogues in the Gulf of Mexico. So too we find on the catalogues *Cytherea chione* and *Natica maroccana*, Mediterranean shells, set down as found also in the Gulf of California; but a direct comparison shows them to be quite different in form and coloration, and well entitled to the distinctive appellations of *Cytherea biradiata* and *Natica Chemnitzii*. *Triton nodosum*, of the West Indies, has also been regarded as identical with a Sandwich Island species (*T. elongatum*). We need not multiply examples of this kind. But if such confusion has arisen among strongly-marked species, how much more liable is it to occur where specific differences are slight. In many genera, as in *Physa* and *Succinea*, the form, surface, and colouring are so uniform throughout, that undoubted species are distinguished by only the slightest differences. Indeed, there are even some genera, like *Helix* and *Nanina*, *Patella* and *Lottia*, which cannot be distinguished but by an examination of the animal. When, therefore, we have before us shells from widely diverse regions, apparently identical, they should be subjected to the most careful scrutiny for structural differences. If no obvious ones are detected, we may not consider the question as settled, unless the animals have been compared; and we may go even further, and require that their internal structure, as well as external features, should be examined. The number of instances where this apparent ubiquity obtains is fast diminishing, as in the cases already mentioned, in those

of *Cyprea exanthema*, *cervina* and *cervinetta*, &c. A large proportion of the shells inhabiting the eastern and western shores of the Atlantic, have been regarded as identical; and many of them are really so. But the closer the comparison, the more it tends to diminish rather than increase the identical species. The same is found true in regard to other classes of animals. In fact, the doctrine of the local limitation of animals, even now, meets with so few apparent exceptions, that we admit it as an axiom in zoology, that species strongly resembling each other, derived from widely diverse localities, especially if a continent intervenes, and if no known or plausible means of communication can be assigned, *should be assumed as different, until their identity can be proved*. Much study of living specimens must be had before the apparent exceptions can be brought under the rule. Some shells undoubtedly have a very extensive range. The species of *Cyprea* are remarkable for this, and more than any other genus would lead us to conclude that oceans present no limitations. Even among them, however, new distinctions are constantly appearing. There are also some shells which may be called cosmopolite. At least they are erratic, and will be found wherever their pabulum is found. Thus, *Helix cellaria*, attaching itself to water-casks, is found in most seaports in all parts of the world. *Helix similaris* is found wherever the coffee-plant grows; and *Helix vitrinoides* in like manner accompanies the *Arum esculentum* or taro. *Bulinus octona*, or a closely allied species, is a parasite of the Banana. But exceptions of this kind confirm rather than militate against the conclusion.

There is a certain local aspect, a peculiar facies, which impresses itself upon us the more we study local collections; just as we learn, by a very little observation, to distinguish men of different nations and neighbourhoods. Thus we distinguish the loose, horny, colourless structure of the northern marine species; the stony, corroded, livid New Zealanders; the polished, absolutely perfect specimens from the coral seas. Certain forms are so characteristic of certain regions that we never expect to find them elsewhere. Thus, we look for *Clausilia* in Europe and Asia; for *Achatina* in Africa; for *Cylindrella* in the

West Indies and their neighbourhood; for *Achatinella* in the Sandwich Islands; for *Partula* in the Pacific Islands, south of the equator; to the United States of America we look for *Helices* with toothed apertures; to the Philippine Islands for the ivory and beautifully painted species, &c., and we venture to call them stragglers, if they are brought to us from any other quarter.

Dr. Pickering remarks, in relation to the Feejee Islands, "It was only here, in the midst of the Coral sea, where I found myself surrounded by a great variety of Cone, Mitre, Olive, Cowry, *Ovula*, *Harpa*, *Terebra*, *Cassis*, *Strombus*, *Conælix*, *Pyramidella*, *Tridacne*, *Vulsella*, *Lima*, &c., that I became fully aware of the imperfect state of this science. We missed *Patella*, *Eburna*, *Terebellum*, *Cancellaria*, *Hippopus*, *Ancillaria*, and *Marginella*. Bivalves seem to prevail less than at Tonga. *Mactra* proper was not met with. In fluviatile shells these islands are richer than the eastern ones, no doubt on account of their larger size and the consequent greater abundance of fresh water. A fresh-water bivalve, *Cyrena*, was here for the first time met with among the islands. Among land-shells we missed *Partula*. The appearance of large *Bulimi* reminded one of the continent." The true *Helices* seem to be supplanted by *Nanina*.

Another point of interest, extensively elucidated by the collections of the Expedition, is the occurrence of analogous species in co-ordinate regions. It is now a received fact that the animals and plants of the northernmost zones are, for the most part, identical throughout the whole circuit; and that the species gradually diverge from each other towards the equator, on the three continents; and that after passing the equator towards the south, there is not a return to the same species, and rarely to the same genera, as we should expect if variation of forms depended mainly on difference of temperature. There is, however, a return to mollusks of a kindred character and form, and oftentimes to the same genera.

The analogies of specimens from distant regions are much stronger when reckoned by isothermal longitude than by isothermal latitude. In the latter case we may have analogous genera. Along our northern

seas, some of the most characteristic shells are *Buccinum*, *Tritonium*, *Fusus*, *Terebratula*, *Rimula*, &c. Around Cape Horn are shells of the same types, so closely allied that they have not yet been separated as distinct genera, though peculiar in many important respects. But this resemblance does not descend to species. In the first case, however, not only have we the same genera, but the species seem to repeat each other: so that species brought from great distances east or west, are scarcely to be distinguished upon comparison. As examples in illustration, we may place against each other the following species from Oregon and from the Eastern States:

<i>Mya præcisa</i> ,	<i>Mya truncata</i> .
<i>Osteodesma bracteatum</i> ,	<i>Osteodesma hyalina</i> .
<i>Cardita ventricosa</i> ,	<i>Cardita borealis</i> .
<i>Cardium blandum</i> ,	<i>Cardium Islandicum</i> .
<i>Venus calcarea</i> ,	<i>Venus mercenaria</i> .
<i>Alasmodonta falcata</i> ,	<i>Alasmodonta arcuata</i> .
<i>Helix Vancouverensis</i> ,	<i>Helix concava</i> .
<i>Helix loricata</i> ,	<i>Helix inflecta</i> .
<i>Helix germana</i> ,	<i>Helix fraterna</i> .
<i>Planorbis vermicularis</i> ,	<i>Planorbis deflectus</i> .
<i>Planorbis opercularis</i> ,	<i>Planorbis exacutus</i> .
<i>Lacuna carinata</i> ,	<i>Lacuna vineta</i> .
<i>Natica Lewisii</i> ,	<i>Natica heros</i> .
<i>Trichotropis cancellata</i> ,	<i>Trichotropis borealis</i> .
<i>Fusus fidicula</i> ,	<i>Fusus turricula</i> .
<i>Lottia pintadina</i> ,	<i>Lottia testudinalis</i> , &c.

Mingled with these are others very different in type, which mark the two localities as constituting very different zoological regions. Where, for instance, have we the analogues of *Panopæa generosa*, *Lutraria ventricosa*, *Triton Oregonense*, on the one hand, and of *Mactra gigantea*, *Fusus decemcostatus* and *Islandicus*, *Pyrula canaliculata* and *carica*, *Pandora trilineata*, &c., on the other? The same comparison holds good between the shells of the Gulf of California and the Gulf of Mexico.

From a consideration of the land-shells collected on the Pacific islands, it seems possible to draw some fair inferences as to the relations of the lands which once occupied the area of the Pacific Ocean, and whose mountain peaks evidently now indicate, or constitute, the islands with which it is now studded. By observation of the species, we think there are strong indications that some groups of islands have an intimate relation to each other, and belonged, at least, to the peaks of the same mountain ranges, before they were submerged; while the indications are equally strong that other groups had no such territorial connexion.

The Samoa, Friendly, and Feejee Islands, are near to each other, and seem as if they must have intimate geological relations. The Samoa and Friendly Islands give evidence of such relation, the same forms and many of the same species occurring on both groups. But, if we may draw inferences from the land-shells, these two groups are more intimately related to the Society Islands, though at a much greater distance, than to the Feejee Islands. Not a single species of land-shell, found on the Feejees, was collected on either of the other groups. Several genera which are common to the other groups are wanting in the Feejees. Thus, no specimen of *Succinea* or *Partula*, genera so abundant in the Society and Samoa Islands, was found at the Feejees; and the true *Helix*, especially the pyramidal forms, so remarkable in the other groups, seemed to be replaced by large species of *Nanina*. On the other hand, large and peculiar species of *Bulimus* occur abundantly on the Feejees, while nothing of the kind occurs on any of the other islands. Indeed, judging from the land-shells, the Feejees are more nearly allied to the islands to the westward,—such as the New Hebrides, than to the Friendly Islands, on the east, though so much nearer. When we examine the fluviatile shells, however, we do not find the same distinction. Many of the same species of *Melania*, *Navicella*, and *Neritina*, seem to occur in all the groups, though the large coronated species of *Melania* prevail in the Feejees. There is some reason to suspect, moreover, that the fresh-water shells collected at these islands have accidentally become more

or less mingled. It must also be considered, that the *Navicella*, and more especially *Neritina*, is oftentimes decidedly littoral, and even marine, in its habits.

The little island of Metia, or Aurora Island, to the northeastward of Taheiti, is one of peculiar interest. It is a coral island, which has been elevated 250 feet, or more, and has no other high island anywhere near it. On it were found four small land-shells belonging to three genera, viz.:—*Helix pertenuis*, *Helix dædalea*, *Partula pusilla*, and *Helicina trochlea*. None of these were found upon any other island. They seem to have originated there, after the elevation of the island, and have a significant bearing upon the question of local and periodical creations in comparatively modern times.

As the genus *Partula* is characteristic of the groups just south of the equator, so *Achatinella* is the characteristic shell of the Sandwich Islands. Closely connected as the islands of this group are, they each have their peculiar forms of land-shells; and, as the southern islands bear evidence of greater age than the northern ones, we may infer that, within these narrow limits, we have evidence of the appearance of some species subsequent to the existence of others now living. On the Island of Kauai, the oldest of the group, we have *Achatina adusta* and *pyramidata*, a form which does not appear on the other islands; the *Achatinellæ* are chiefly of the elongated glabrous form, which I have grouped under the name *Leptachatina*; the *Helices* are planorboid and multispiral. On Molokai, the species of *Achatinella* are large and beautiful, and peculiar in their form and colouring. On Maui, the *Helices* are small and glabrous, with some very curious hispid and ribbed species, with lamellæ within the aperture. On Oahu, the species of both *Helix* and *Achatinella* are similar to those on Maui. On Hawaii, *Succinea* seems to prevail in larger proportion than on the other islands, while *Achatinella*, which occurs so abundantly on all the other islands, either does not occur at all, or but very rarely.

Boston, December, 1851.

MOLLUSCA.

ORDER GASTEROPODA.

GENUS ATHORACOPHORUS—(GOULD.)

Corpus limaciforme, supra convexum, retrorsum attenuatum, requiescens spirale, pallio à soleâ discreto ubique tectum, clypeo carens; foramine pulmonali submediano, inoperto; tentaculis binis brevibus, conicis, oculiferis, ad apicem bulbosis, haud omnino retractilibus; dorso sulco mediano ramoso impresso. Lamina calcarea nulla.

Body limaciform, depressed, convexly rounded above, gradually tapering backwards, coiled when at rest, covered throughout by the mantle, which is distinguished from the foot by a faint groove. Clypeus entirely wanting, the pulmonary aperture on the right side, near the median line, entirely unprotected; a delicate channel runs along the back, with numerous lateral branches. Tentacles only two, short, dilated at base and tip, not wholly retractile. No shell.

The animal on which I have founded this genus was evidently observed by Quoy and Gaimard, and was described in the Voyage of the Astrolabe under the name of *Limax bitentaculatus*, and indicated by them also as the type of a new genus. No other one of the Limacidae has the position of the respiratory aperture so near the dorsal line, or so completely exposed, like a mere perforation. Nor am I aware that any one has the habit of coiling itself up, when at rest, in the manner delineated. These characters, together with the existence of only two tentacles, have induced me to institute the genus.

ATHORACOPHORUS BITENTACULATUS (*Quoy*) *Gould*.

Limax bitentaculatus, QUOY, Voy. de l'Astrol., Zool., II. 148, pl. 13, fig. 1-3; LAMARCK, Anim. sans Verteb., 2 ed., VII. 723.

The figure of Quoy is so imperfect that it is worth while to give a more exact one, taken from a living animal. It is of a pale yellow colour, covered with dot-like tubercles of a brownish hue. The lateral branches of the dorsal grooves are not strictly parallel and simple, but many of them are again branched. The little dilatation of the tentacles is stated by Mr. Drayton to be simply "a shoulder or enlargement," and not a sheath. There is also represented a minute tubercle in the place of the oral tentacles. The coiled attitude, I believe, is not assumed by any other one of the Limacidæ.

Length about one inch; breadth one-fifth of an inch.

It was found by Quoy and Gaimard at Tasman's Bay; and by Dr. Pickering at the bottom of a crater at Taïamai, Bay of Islands, New Zealand.

Figure 6, animal extended; 6 *a*, view of the back; 6 *b*, mode of coiling itself; 6 *c*, the head.

ARION FOLIOLATUS (*Gould*).

A. corpore depresso, fulvo, sulcis nigricantibus obliquè reticulato, areolis inclusis foliosis; clypeo prælongo, lævi, fulvo, concentricè fusco-notato; aperturâ communi ante-medianâ; tentaculis parvis, brevibus.

Colour a reddish fawn, coarsely and obliquely reticulated with slate-coloured lines forming areolæ, which are indented at the sides, when viewed by a magnifier, so as to resemble leaflets; the corselet is concentrically mottled with slate-colour, and the projecting border of the foot is also obliquely lineated. The body is rather depressed, nearly uniform throughout, and somewhat truncated at the tip, exhibiting a conspicuous pit, which was probably occupied by a mucus-gland.

The shield is very long, smooth, and has the respiratory orifice very small, situated a little in front of the middle. The tentacles are small and short.

Length, three and one-half inches.

Found by Dr. Charles Pickering near Discovery Harbour, Puget Sound.

That this animal belongs to the genus *Arion* there can be little doubt, from the peculiar structure of the tail, as represented in Mr. Drayton's figure, and from the anterior position of the respiratory orifice. It is a well-marked species, characterized especially by the little leaf-like areolæ by which the surface is marked.

Figure 2, side view; 2 *a*, papillæ enlarged; 2 *b*, dark variety.

LIMAX COLUMBIANUS (*Gould*).

L. corpulentus, corpore elongato, posticè carinato, sordidè flavo, unicolore vel maculis atropurpureis nubeculato, tuberculis elongatis longitudinaliter dispositis tessellato; clypeo lato, anticè truncato; aperturâ communi posticâ.

Colour a dark, dirty, greenish-yellow, either uniform or in some varieties clouded with large, purplish-black, irregular blotches. The body is large and corpulent, the anterior portion elevated, with the back rounded, and the posterior portion strongly carinated; at the posterior tip there is apparently a mucus-pore. The margin of the foot extends beyond the mantle and forms a ruffle around the animal, with transversely oblique markings. The surface is tessellated with coarse, elongated papillæ arranged longitudinally. The corselet is broad, truncated in front, minutely granulated, with the respiratory orifice at the posterior third. Front vertically wrinkled: upper tentacles rather short, thickened at base, coloured like the body, and finely granulated; lower tentacles long and slender.

Length, five and one-half inches.

The calcareous rudiment is oblong, the angles truncated so as to give an hexagonal outline ; apex median and nearly terminal.

Oregon, at Nisqually, by Mr. Dyes, and at Discovery Harbour, Puget Sound, by Lieutenant Case.

There can be no doubt that the mottled animals are varieties of the uniformly coloured ones, because they were not only taken in company, but in coitu. A smaller specimen is of a uniform slate-colour. In general it resembles *A. empiricorum* in form, marking, and colouring, with the exception of the head, which in that species is slate-coloured. The position of the respiratory orifice is also much more anterior. No land mollusk has yet been found to the west of the Rocky Mountains identical with any species on the Atlantic side ; and although several European slugs have been carried to distant shores, where they have become naturalized in limited districts, it is too much to suppose that any of them have thus become numerous at several localities about Puget Sound.

Figure 1, side view ; 1 *a*, mottled variety ; 1 *b*, face ; 1 *c*, calcareous rudiment.

LIMAX OLIVACEUS (*Gould*).

L. elevatus, retrorsum carinatus, plus minusve acuminatus, ex olivaceo purpurascens, papillis angustis, elongatis, obliquis reticulatus : clypeo curto, rotundato, concentricè rugoso ; foramine antico ; fronte reticulato ; tentaculis cervicalibus elongatis, attenuatis, nigricantibus.

ANIMAL elevated, more or less carinated, acuminate posteriorly. Colour dark olive, inclining to purplish or mahogany colour on the back, paler on the corselet and at the edges ; tentacles dark slate. Surface minutely and obliquely reticulated with very delicate lines. Corselet short and rounded, concentrically lineated, evidently containing a calcareous rudiment ; the respiratory orifice situated at the posterior fourth. Head small, front reticulated ; cervical tentacles long and slender, the oral ones small.

Length two and a half inches.

Found at Paramatta, New South Wales, by Mr. Couthouy.

This is very peculiar on account of its pale olive colour, and its very delicate, narrow, elongated papillæ. It is attenuated both in height and breadth, and terminates in a delicate point. The head is also protruded, and all the portion anterior to the corselet is narrowed.

Figure 3, side; 3 *a*, contracted; 3 *b*, transverse section.

LIMAX FULIGINOSUS (*Gould*).

L. abbreviatus, corpulentus, acutè carinatus, fuliginosus, sulcis remotis obliquis reticulatus, areolis reticulatis; clypeo ovali, posticè latiori, foramine pulmonali postico; capite parvo; tentaculis brevibus, ad apicem ferrugineis.

Body rather short and corpulent, elevated, sharply carinated, especially at its posterior portion. Colour uniform sooty black. Corselet oval, of moderate size, broadest behind, the dorsal face showing traces of a large calcareous test; respiratory aperture situated at the posterior third. Surface coarsely reticulated by oblique fissures, the included areas being more minutely reticulated with smaller fissures. Head small, tentacles rather short, ferruginous at tip. Foot projecting slightly beyond the edge of the mantle, which is transversely and rather distantly lineated. Posterior termination acute.

Length two and a half inches.

Found at the Bay of Islands, New Zealand, among turnips in a garden. Dr. Pickering remarks that it seems undoubtedly to be a native species. It is specially characterized by its peculiar sooty appearance.

Figure 4, the animal crawling; 4 *a*, transverse section.

VAGINULUS TAUNAISII (*Ferussac*).

Corpus elongatum; colore flavescente; tentaculis obscuris.

Vaginulus Taunaisii, FERUSSAC; Tab. Syst. 13, pl. viii. B. f. 1, 2.

Body long, very slender, somewhat widening backwards, of a pale yellowish colour, tinted green, and with two stripes of deeper green along the back, everywhere dotted with opaque white; cervical tentacles very long, slate-coloured, and somewhat annulate; oral tentacles about the usual proportionate length, furnished at base with a short triangular process like a spur. Back rounded, and provided with numerous pores from which the mucus is abundantly secreted. Locomotive disc narrower than the mantle, and projecting behind it, transversely wrinkled, the edge pea-green.

Length, when extended, about seven inches.

Found by Mr. Couthouy on an orange tree, near a mountain torrent, in the vicinity of Tijuca, near Rio Janeiro. Dr. Pickering also found the same species at the same locality. [J. P. C.]

Mr. Couthouy remarks that the motions of the animal were very quick, gliding along more rapidly than he had ever seen any of its congeners. It often reared up two-thirds of its long body nearly perpendicularly, and remained so for some time, turning its head in every direction, sometimes arching it over like a swan's neck, and again stretching it up so as to call to mind the giraffe, thus giving the snail quite an intelligent though somewhat laughable aspect.

I have regarded this as the *V. Tainaisii*, of which our descriptions are very imperfect, but still definite enough to show that its colours are variable; and our species seems to differ from the description given of it in this respect only. At any rate, its characters are so definitely given, as well as some of its habits, that it seems proper to present the observations and figures herewith given. Should it be found entitled to a distinct appellation, I would propose for it that of *V. superbus*.

Figure 5, the animal extended; 5 *a*, the head; 5 *b*, portion of the foot.

VITRINA RUIVENSIS (*Couthouy*, M.S.) (*Gould*).

Testa haliotiformis, transversè subquadrata, depressa, papyracea, pellucida, nitida, chlorata, gradibus ætatis striata: spira vix conspicua,

anfractu unico rapidè crescente; apice laterali: apertura faciem inferiorem adequans; labro propè spiram membranaceo; columellâ laxè intro spiram volvente et eam penitus exhibente.

ANIMAL nearly enveloping the shell, very long compared with the two preceding, the lower portions ochreous brown, the mantle of the same colour, closely mottled with jet black; foot high, compressed above, and generally undulating along the back, rarely extending itself so as to be regularly tapering; tentacles very dark slate-colour, with a darker central portion extending along the cervical ones, which are long and tapering, to some distance under the mantle; oral pair very short; a slight furrow surrounds the foot, the margin of which is rather lighter-coloured than the rest of the body; respiratory orifice very small; mucus-pore very small, and placed just above the termination of the foot.

SHELL transparent, thin, flexible, of a beautiful sap-green towards the spire, gradually turning to yellow near the lip. Haliotiform, the spire sub-terminal, not forming an entire revolution, and wholly visible internally. Aperture enormous, occupying the whole face of the shell; lip thin and membranous, inflexed from the columella for about one-third its extent.

Diameter five-eighths of an inch; axis one-tenth of an inch.

Found by Mr. Couthouy on the Pico de Ruivo, Madeira, thirty feet from the summit, 6210 feet above the sea, under moss, at the roots of *Erica arborea*. Only two specimens were obtained.

This is a very large and well-marked species. It is closely allied to *V. Lamarckii*, but the shell, as well as the animal, is sufficiently distinct. [J. P. C.]

Figure 7, the animal extended; 7 *a*, the animal retracted in the shell; 7 *b*, back of the shell; 7 *c*, aperture of the shell; 7 *d*, profile of the shell.

VITRINA MARCIDA (*Gould*).

Testa sigaretiformis, tenuis, sub-opaca, flavo-viridis, depresso-orbicularis, tenuiter striata, sub-perforata: spira anfractibus ad tribus convexi-

usculis ; ultimo amplo, declivo ; apice sub-centrali ; suturá benè impressâ : apertura transversa, elliptica ; labro plerumque membranaceo.

ANIMAL of an ochreous brown colour, with a tinge of green towards the foot, between which and the body is a slight furrow. The mantle, which for the most part envelopes the shell, is mottled with black, and covered with longitudinal wrinkles, intersected by fine, transverse lines, and appears covered with minute granules when the animal is contracted. The rest of the body is covered with minute, interrupted, longitudinal lines, of a darker colour, assuming on the back and foot the appearance of fine squamiform plaits. Cervical tentacles long and slender ; oral ones about half as long, and like them dark slate-coloured ; on the back of the neck is a faint double groove, with a narrow white streak on each side. The foot is compressed and subcarinated posteriorly, and has a slight canal extending from the shell nearly to the extremity. Respiratory orifice very large, near the upper and posterior portion of the mantle ; mucus-pore very near the extremity of the foot, on the upper side, quite small, but secreting considerable thin mucus, which gives the whole foot a glossy appearance.

It differs from the animal of *V. Lamarckii* by the truncation of the corselet anteriorly, and by having the markings on the side of the neck longitudinal instead of oblique.

SHELL of a dull yellowish-green colour ; apex of the spire sub-central, with three volutions, the last of which is disproportionately large, depressed, discoidal, the sutures very indistinct. Aperture sigareti-form ; columella short, distinct, slightly reflected, blending inferiorly with the external lip, which is thin and membranous, doubling to the touch like moist paper ; during life the lip has a clear, hyaline appearance, but after death it becomes opaque, and chalky white within. There is a slight umbilical indentation.

Diameter about half an inch ; axis about one-third as much.

Found by Mr. Couthouy at Roche de Empeña, Island of Madeira, at a height of 4200 feet.

This species differs from *V. Lamarckii* in having more whorls to the shell. The animal is still more decidedly different. [J. P. C.]

Figure 12, dorsal view, with the animal extended ; 12 *a*, front of the animal ; 12 *b*, base of the shell ; 12 *c*, edge of the shell.

VITRINA NITIDA (*Gould*).

Testa depresso-globosa, heliciformis, tenuissima, pellucida, nitidissima, lævigata, succineo-viridis, imperforata: spira anfractibus quatuor convexis, ultimo amplo; apice subcentrali, exserto; suturâ excavatâ: apertura transversa, subcircularis; peristomate inflexo; columellâ arcuatâ, usque ad apicem perspicuâ.

ANIMAL of a uniform slaty-brown, except the mantle, which is smooth, almost black, and so small as to leave the shell almost entirely exposed; anterior part of the body with nine or ten oblique lines or furrows on the neck. Tentacles black, the cervical ones very long and slender; the oral ones about one-third as long; a black line extends a short distance upon the neck from the upper pair of tentacles. Foot very short posteriorly, and tapering; mucus-pore imperceptible.

SHELL sigaretiform, transparent, glistening, brownish-yellow, tinged with bright green at the summit, which is darker than the rest. Volutions four, axis prominent, submedian; sutures deeply impressed. Aperture ample; lip slightly involute, continuous with the columella, which extends into the spire. No trace of any umbilical indenture.

Greatest diameter less than half an inch; axis one-eighth of an inch.

Obtained by Mr. Couthouy above Roche de Empeña, towards Pico de Ruivo, Madeira, at an elevation of 4240 feet.

A most elegant and brilliant species, closely resembling *V. marcida*. The animal differs chiefly in the mucus-pore not being perceptible, and the absence of the fissure on the back of the foot. The corselet is, however, a great deal smaller, never, as in that species, wholly concealing the shell. [J. P. C.]

Figure 8, top of shell, with the animal ; 8 *a*, base of the shell ; 8 *b*, profile of the shell.

VITRINA ROBUSTA (Gould).

Testa helicoidea, transversa, depresso-globosa, sub-valida, polita, perhucida, dilutè flavo-viridis, lineis incrementalibus regularibus, obtusis striata: spira obtusa, anfractibus tribus, ultimo magno; apice sub-centrali; subtus rotundata: apertura circularis; margine sinistro supernè reflexo, rimam umbilicalem parvam formante.

SHELL large, heliciform, depressed, firm, smooth, and diaphanous, faintly marked by somewhat regular lines of growth, and of a pale yellowish-green colour. Whorls three, forming an obtuse, depressed spire, the outer one rapidly increasing, rounded at periphery; suture rather deeply impressed or channelled. Beneath convexly rounded. Aperture transverse, ample, nearly circular, and largely modified by the penultimate whorl; lip slightly reflexed, forming a slight chink behind the columellar portion.

Diameter half an inch; axis one-fourth of an inch.

Inhabits New South Wales, and was presented by Mrs. Mitchell.

This has about the size and form of *V. nigra*, Quoy, and is almost exactly like *V. Freycineti*, Férussac. It is more globose and brilliant than *V. marcida*, and seems to be more substantially constructed than any other species.

Figure 11, front; 11 *a*, back; 11 *b*, base of the shell.

VITRINA CAPERATA (Gould).

Testa helicoidea, depresso-globosa, ad peripheriam obtusè angulata, tenuis, sub-opaca, striis incrementalibus conspicuis et rugis obliquis ramulosis, præcipuè supernis, exarata, dilutè fulvo-cornea, arctè perforata: spira anfractibus tribus cum dimidio convexis, citò crescentibus; suturâ profundâ; apice subcentrali: apertura sub-circularis; labro simplici, ad umbilicum everso; columellâ, callum simulante, secundem spiram introeunte.

SHELL rather larger, and of a firmer structure than most species, rather opaque, and of a dull surface. It is of a subcircular, depressed form, obtusely angular at the periphery, and composed of about three and a half rapidly increasing, convex whorls, separated by a deep suture, and having the apex nearly central. The colour is tawny yellow. The striæ of increment are coarse, somewhat irregular, and the surface, except near the umbilicus, and more especially above, is wrinkled with sinuous, branching furrows, not conforming to either axis of the shell. Aperture nearly circular, the penultimate whorl but slightly encroaching upon it; lip simple, the columellar portion reflected against a rather large umbilical perforation, and produced above in the form of a delicate white callus, which is seen to revolve within the shell in the direction of the spire.

Largest diameter nearly half an inch; axis one-fifth of an inch.

Obtained by Mr. Couthouy on the island of Kauai, Sandwich Islands.

A large and substantial species, easily distinguished by the branching wrinkles of the surface, which probably correspond to the blood-vessels of the animal.

Figure 9, front view of the shell; 9 *a*, view from above.

VITRINA TENELLA (*Gould*).

Testa parva, V. pellucidæ simillima, succinea, sub-perforata, gradibus ætatis conspicuis striata: spira rotundata, apice subcentrali, anfractibus tribus, convexis, declivibus; suturâ excavatâ: apertura sub-circularis; labro antrorsum arcuato.

SHELL minute, fragile, pellucid, heliciform, rather globose, of a pale amber-colour, and with a slight umbilical depression. The spire is elevated and obtusely rounded, composed of three convex whorls, the outer one large and sloping, separated by a deeply impressed suture, and distinctly marked by the lines of growth. Aperture nearly circular, rather large, the lip curving forwards, so as to be protruded at the middle.

Diameter one-third of an inch ; axis one-eleventh of an inch.

Found by Mr. Couthouy at Kauai, Sandwich Islands.

It is much like *V. pellucida*, but is larger, more opaque, and the aperture is larger, in consequence of the basal portion of the lip making a more convex curve.

Figure 10, the front; 10 *a*, the back; 10 *b*, the base of the shell, enlarged; 10 *c*, natural size of the shell.

VITRINA FURVA (*Lowe*) *Gould*.

Helix furva, LOWE; Primit. Faunæ Mader. 40, pl. 5, f. 2. DESHAYES, in Lamarck, Anim. sans Vert., viii. 96.

ANIMAL a very pale salmon-colour, projecting very little behind the shell. Cervical tentacles very long and slender, slaty black, with a still darker line along their posterior face down to the shell; eyes very minute, on a slight terminal bulb; oral tentacles very short, dark, and with a black line running backwards along the cheeks and neck. Respiratory orifice rather small, situated at the posterior and inferior edge of the mantle, which is but slightly developed, and scarcely protrudes from the shell. Genitalia at the base of the oral tentacles, between them and the cervical tentacles. [J. P. C.]

Found by Mr. Couthouy, about four miles from St. Anna, Madeira, in a mountain pass.

From the shell itself (which is immature), as well as from Mr. Couthouy's description of it, I suppose it to be the *Helix furva* of Lowe. I introduce it here, on the authority of Mr. Couthouy, who, from examination during life, decides that it is "a *Vitrina* belonging to the division capable of being wholly contained in the shell." I should rather have arranged it with *Succinea*, allied to the peculiar helicoid form of that genus found in Brazil. The structure of both the animal and the shell justify its removal from the genus *Helix*.

SUCCINEA EXPLANATA (*Gould*).

Testa parva, tenuis, scutellæformis, rotundato-elliptica, pænè evoluta, concentricè striata, luteo-cornea: spira marginalis, ferè nulla, omninò aperta; columellâ arcuatâ.

SHELL small, thin, of a rounded elliptical outline, and of a shallow, saucer-shaped or shield-like form. The surface is concentrically striated, and covered by a yellowish-green epidermis. The spire is marginal, at one end of the ellipse, and makes only a part of one revolution. The columellar margin of the aperture sweeps round in a gentle spiral, and terminates a little within the margin of the outer lip, thus forming a small umbonal cavity.

Longest diameter one-fourth of an inch; shorter diameter one-fifth of an inch.

Found by Mr. Couthouy, at the island of Kauai, Sandwich Islands.

Mr. Couthouy has labelled the shell "Testacella," but has given no account of the animal. As the formation of the spire does not correspond with that genus, and as it seems to be only the extreme modification of a group peculiar to the Sandwich Islands, of which the three following species are members, I have placed it with them, in the genus *Succinea*. There is also a *Succinea* from Guadaloupe of the same model, though considerably more convolute.

Figure 31, 31 *a*, 31 *b*, three views of the shell, enlarged; 31 *c*, natural size.

SUCCINEA PUTAMEN (*Gould*).

Testa magna, depressa, globoso-elliptica, tenuis, lævis, striis incrementalibus et striis volventibus tenuiter decussata, fulvo-cornea, ad peripheriam sub-angulata: spira ferè nulla, anfractibus vix duobus; suturâ lineari: apertura paginam inferiorem ferè adequans, rotundato-ovalis; margine columellari sub-plicato.

Succinea putamen, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 182. Nov. 1846. Expedition Shells, 28.

ANIMAL much larger than the shell, forming, when extended, a broad, oval disc, twice the length of the shell, the foot sometimes advancing in front of the head; mantle considerably surpassing the shell; respiratory orifice on the right side, a little behind the middle of the shell; flesh-coloured, dotted with brown, especially on the cheeks, between the tentacles, and on the top of the foot, and having faint diverging lines on the flanks.

SHELL semi-ovoid, very thin and transparent, becoming thickened and opaque and pale when superannuated, of a brownish horn-colour when fresh; surface smooth and regular. Whorls scarcely two, the upper one merely indicated by a sutural line, not prominent, but coincident with the general surface. There are a few faint revolving striæ, more especially posteriorly. Beneath plane, the aperture nearly as large as the shell, regularly oval, the lip somewhat decurrent on the left side; the columella has a distinct fold far back, in large specimens, and considerable enamel.

Length of axis five-eighths of an inch; breadth half an inch.

Inhabits moist places, and especially taro-patches, at the island of Upolu.

A remarkable shell, resembling the half of a bird's egg. Distinguished from *S. rotundata* by its larger size, revolving striæ, and angular periphery.

The animal is evidently quite distinct from the usual form of *Succinea*, and would perhaps be ranked under Férussac's genus *Helicolimax*. At any rate, this with the two following species, belong to a peculiar group; and I am not aware of any similar form being found elsewhere than at the Navigator's and Sandwich Islands.

Figure 16, animal with the shell, viewed laterally; 16 *a*, the same seen from above; 16 *b*, aperture of the shell.

SUCCINEA ROTUNDATA (*Gould*).

Testa parva, tenera, sub-opaca, hemispherica, flavido-virens, concinnè striata: spira ferè nulla, intus aperta; anfractibus duobus cum dimidio, ultimo amplissimo: apertura circularis, posticè angulata, testam ferè adequans; margine columellari obliquo, subrecto, conspicuè plicato, et callo lato induto.

Succinea rotundata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 182. Nov. 1846. Expedition Shells, 27.

ANIMAL much too large for the shell, finely punctured with vermillion, with a dusky stripe along the middle of the tail, and one passing back from each tentacle: tentacles very much developed.

SHELL small, very thin and fragile, of a pale russet colour, the surface very regular and smooth, crossed by very fine and rounded lines of growth. As it lies upon its aperture the periphery is nearly circular, a little oval, and its back is spherically rounded. There are two and a half whorls, the upper one forming a very minute spire scarcely rising above the general surface. Base rounded. Aperture nearly as large as the shell, somewhat angular posteriorly, displaying the interior of the spire; columella oblique, very slightly arcuate, having a distinct fold, and a broad coating of enamel across the penultimate whorl. Interior silvery white, calcareous.

Greatest diameter two-fifths of an inch; least diameter seven-twentieths of an inch; axis three-twentieths of an inch.

Obtained by Dr. Pickering on the mountains of Oahu, Sandwich Islands.

Its general form is like that of *S. putamen*, but it is much smaller, and not angular at the periphery.

Both are remarkable for their regularly rounded, hemispherical form. There are no revolving striæ. The lip comes off so near the summit of the spire that the apex is not visible, when the shell lies on its back.

There is reason to think that the shell described by Mr. Lea, under the name of *S. aperta*, is the same as this; and that really, it was brought by Mr. Nuttall from the Sandwich Islands, instead of from Oregon. It is one of the forms peculiar to those islands, whereas nothing similar has been found on the American continent.

The *Ambrette fragile* of Souleyet, figured in the Voyage of the Bonite, pl. 28, f. 18-20, is also apparently the same as this, though the representation is not good.

Figure 14, the aperture; 14 *a*, the spire; 14 *b*, the profile of the shell, magnified; 14 *c*, natural size.

SUCCINEA CEPULLA (Gould).

Testa parva, tenuissima, pellucida, nitida, succineo-virens, rotundato-elliptica, depressa, sinistrorsum rotundata, dextrorsum declivis, longitudinaliter striata et liris inequalibus volventibus arata: spira ferè nulla, anfractibus duobus cum dimidio: apertura amplissima, ovalis, ad basim latè rotundata, ad columellam arcuata, leviter plicata; intus metallica.

Succinea cepulla, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 182. Nov. 1846. Expedition Shells, 27.

ANIMAL not observed.

SHELL depressed, nearly elliptical, remarkably broad posteriorly, the back rounded on the columellar side, and shelving, rather than rounded towards the outer lip: very thin and transparent, shining, amber-coloured. Surface marked with rather coarse and irregular lines of growth, and with coarse, shallow, and distant revolving furrows. Spire very minute; whorls two and a half, the last composing nearly the whole shell; suture well marked; body of the shell beneath very small. Aperture very large, the lip making a remarkable sweep outwards, at its posterior portion, and broadly rounded at base; columellar portion delicate, slightly folded. The interior has a metallic lustre.

Longest diameter or axis one-half an inch, shorter diameter seven-twentieths of an inch; height one-fifth of an inch.

Found on the island of Hawaii, Sandwich Islands, by Dr. Pickering and Mr. Drayton.

Like *S. rotundata*, it is depressed in form, and nearly destitute of an obvious spire; but it is larger, more transparent, is marked with revolving furrows, is rather oblong than circular, and the peculiar sweep of the lip gives the aperture a somewhat auricular form, posteriorly.

Figure 15, the aperture, and 15 *a*, the profile of the shell, magnified; 15 *b*, natural size.

SUCCINEA LUMBALIS (*Gould*).

Testa mediocris, ovato-conica, tenuissima, sublucida, pallidè virens, leviter striata, subtus gibbosa: spira acutè conica; anfractibus tribus convexiusculis, ultimo ventricosus, versus suturam declivi: apertura rotundato-ovata; columellâ valdè arcuatâ, callo indutâ; plicâ mediocri.

Succinea lumbalis, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 183. Nov. 1846. Expedition Shells, 28.

SHELL of moderate size, conic-ovate, thin and fragile, faintly transparent, without lustre, of a dull, light yellowish-green colour, and marked with fine, obtuse lines of growth. Spire well developed, apex acute, whorls three or more, those of the spire slightly convex, and separated by a merely linear suture; the last whorl inflated, most so anteriorly, and sloping to the suture behind the middle, so as to give the upper part of the shell a regularly conical form. Body beneath tumid and large, with a slight columellar fold; columella roundly arched. Aperture rounded ovate, not three-fourths the length of the shell.

Length of axis nine-twentieths of an inch; greatest breadth one-fourth of an inch, lesser transverse diameter one-fifth of an inch.

Obtained on Mauna Kea, Hawaii, and also on the island of Kauai, Sandwich Islands, by Mr. Couthouy.

Its dull aspect, conical spire, and ventricose form are its distinctive marks. It resembles small specimens of *Limnea catascopium*, Say.

Figure 18, the front, and 18 *a*, the profile view of the shell, enlarged; 18 *b*, natural size.

SUCCINEA HUMEROSA (*Gould*).

Testa ovata, depressa, sub-rhombea, sublucida, striis incrementalibus rugosa, sulcis raris volventibus interdum arata, dilutè virens, et interdum rubricans: spira anfractibus tribus, ultimo permagno, posticè sub-angulato: apertura sub-ovalis, posticè amplificata; labro dextrorsum decurrente; plicâ columellari conspicuâ.

Succinea humerosa, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 183. Nov. 1846. Expedition Shells, 28.

ANIMAL corpulent, drab-coloured, thickly dotted with dusky and rose-red, and with a roseate edge; a dusky line passes back from each tentacle; the surface is finely reticulated, and there are some indistinct radiating lines.

SHELL rather large, compressed, broad-ovate or somewhat rhomboidal; surface rather coarsely wrinkled by the lines of increment, and usually with one or more indented revolving furrows, looking like defects in the shell. Colour pale dead green, sometimes tinged reddish. Spire well developed, somewhat reflexed, composed of three whorls, distinctly defined by a suture, the last one large, and having an indistinct angle at its posterior fourth, so as to form a shoulder which is quite conspicuous as it approaches the outer lip. Aperture large, nearly oval, rounded posteriorly, and having the lip reflected down the body of the shell, and also a decided flexure at the right margin, corresponding to the angle of the whorl; columella with a distinct fold.

Length of axis three-fifths of an inch ; greatest breadth three-eighths, lesser breadth one-fifth of an inch.

Found by Mr. Couthouy, at Tahiti, on wild sugar-cane, at elevations of from 250 to 4000 feet.

About the size of *S. amphibia*, and well characterized by the angular shoulder of the last whorl. The aperture is peculiarly broad on account of the outward sweep of the lip.

Figure 19, front of the shell ; 19 *a*, lateral view of the shell.

SUCCINEA INFUNDIBULIFORMIS (*Gould*).

Testa acuto-conica, infundibuliformis, ad basim perobliquè truncata, concinnè striata, opaca, viridis : spira obtusa, anfractibus duobus cum dimidio planulatis, ultimo magno ; suturâ lineari : apertura rotundato-ovata ; margine sinistro inflexo, ad peripheriam carinato.

Succinea infundibuliformis, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 186. Nov. 1846. Expedition Shells, 30.

ANIMAL "pale ochreous, finely dotted with black on the head, neck, and posterior extremity." [J. P. C.]

SHELL rather firm and opaque, in the form of an acute cone obliquely truncated at base, distinctly and somewhat regularly marked by distant striæ of growth. Colour pale greenish. Spire mammillate at apex, composed of two and a half flattened or even concave whorls, scarcely defined by the suture. Aperture broad-ovate, two-thirds the length of the shell, the columellar portion of the lip inflexed, not sinuate, in some instances having a distinct marginal carina, in continuation of the suture, at the posterior angle of the aperture, quite round to the base of the shell. Interior displayed to the apex, silvery white.

Length of axis seven-tenths of an inch ; breadth seven-twentieths of an inch.

Inhabits the mountains of Tahiti and Eimeo at an elevation of 1000 to 2000 feet, where it is often found on the stems of Fehis.

A most remarkable, tunnel-shaped species, resembling precisely the sugar-cockles of the confectioners. It is allied to *S. procera*, which has all the outlines a little convex, an amber colour, and no inflection of the columellar margin.

Figure 26, the aperture, and 26 *a*, the profile view enlarged; 26 *b*, natural size; 26 *c*, the animal with the shell; 26 *d*, head of the animal.

SUCCINEA PROCERA (*Gould*).

Testa magna, elongata, lanceolata, fulvo-cornea, striis incrementalibus crassis rugosa: spira acuta, anfractibus tribus perobliquis convexiusculis composita, partem longitudinis ferè dimidiam æquans: apertura ovato-oblongata; labro posticè decurrente; columellâ arcuatâ, sub-incrassatâ.

Succinea procera, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 187. Dec. 1846. Expedition Shells, 30.

ANIMAL pale yellowish, roseate on the sides of the neck, with a dark stripe running back from each tentacle; on the sides are fine diverging dusky lines, and scattered black dots; tentacles small.

SHELL rather large, elongated, pale brownish horn-colour, the surface wrinkled with coarse lines of growth; spire tapering and acute, composed of three very oblique whorls; suture deep. Aperture rounded-ovate, rather more than half the length of the shell; the outer lip returning somewhat down the right side of the posterior angle; columellar lip regularly arched, slightly thickened.

Length of the axis seven-tenths of an inch; breadth three-tenths of an inch.

Found at various places on the islands of Tahiti and Eimeo.

A large, remarkably slender species, of coarse exterior, somewhat like *S. infundibuliformis*, but resembling, much more, specimens of our *Limnea umbrosa*.

Figure 28, the aperture ; 28 *a*, profile of the shell ; 28 *b*, the animal bearing the shell.

Succinea vesicalis (Gould).

Testa tenuissima, fragilis, lucida, latè ovata, depressa, gradibus ætatis undulata, epidermide stramineâ induta: spira anfractibus tribus, ultimo magno, patulo, cæteris spiram parvam formantibus: apertura sub-ovalis, ad basim latè rotundata, longitudinis $\frac{4}{5}$ equans; plicâ columellari conspicuâ.

Succinea vesicalis, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 183. Nov. 1846. Expedition Shells, 28.

SHELL broad ovate, very thin and fragile, shining, undulated by the stages of growth, covered with a straw-coloured epidermis. Whorls three, the two upper ones forming a minute, reflexed spire; suture moderately impressed; body of the shell beneath pretty large and rounded. Aperture very large, broad ovate, very broadly rounded at base, lip not reverting on the left side; fold of the columella well-marked; interior shining and silvery.

Length of axis three-fifths of an inch; greatest breadth three-eighths, lesser breadth two-eighths of an inch.

Found by Mr. Couthouy, on Mauna Kea, at an elevation of 7000 feet, Hawaii, Sandwich Islands.

In shape it is much like *S. rubescens*, except that the columellar portion is more fully arched anteriorly.

Figure 17, view of the aperture ; 17 *a*, profile view of the shell.

Succinea pudorina (Gould).

Testa elongata, ovato-turrita, tenuis, lucida, striis conspicuis longitudinalibus notata, succineo-rubescens: spira elevata, anfractibus tribus cylindræis valdè obliquis et suturâ profundâ discretis composita.

Apertura testæ trientes duos adequans, elongato-ovata, angusta; columellâ obliquâ, sub-rectâ, vix plicatâ.

Succinea pudorina, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 186. Nov. 1846. Expedition Shells, 30.

ANIMAL small, of a dark, ochreous colour, tinted roseate, and mottled in a somewhat radiate manner by dusky pencillings; a dusky line along the back of the tentacles; surface very finely reticulated.

SHELL rather large, thin and fragile, elongated, slender ovate, of a pale amber-colour, more or less tinted with roseate, especially at tip; surface roughened by coarse lines of increment. Whorls three, very oblique, and forming an acute, elongated, partially reflexed spire; they are remarkably rounded, and separated by a profound suture. Aperture two-thirds the length of the shell, narrow and regularly ovate, lip slightly retiring posteriorly, and consequently convex in profile; columellar fold very slight.

Length of axis eleven-twentieths of an inch; lateral breadth four-tenths, vertical breadth one-fifth of an inch.

Inhabits the mountains of Tahiti and Eimeo, at an elevation of from 200 to 4000 feet.

This species is closely allied to the elongated variety of *S. amphibia*, or to the American species which passes under the name of *S. ovata*. It has a more slender figure, and more elongated spire than *S. humerosa*, and the penultimate whorl, when viewed on the side of the aperture, is nearly twice as long; the aperture itself is also much narrower and more contracted.

Figure 27, the aperture, and 27 *a*, the profile view of the shell; 27 *b*, the animal bearing the shell.

SUCCINEA VENUSTA (*Gould*).

Testa mediocris, ovata, tenuis, pellucida, nitida, ordinatim striata, epidermide succineâ interdum virescente induta, subtus gibbosa: spira conspicua, obtusiuscula, anfractibus duobus cum dimidio rotundatis:

apertura ovata, longitudinis testæ trientes duos adequans, posticè angulata ; columellâ obliquâ, absque plicâ.

Succinea venusta, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 186. Nov. 1846. Expedition Shells, 30.

SHELL of middle size, beautifully proportioned, ovate, thin, transparent and shining, of a pale, sometimes greenish amber-colour, marked with rather distant, nearly regular, rounded lines of growth. Whorls two and a half, gracefully rounded, separated by a deep suture, and forming a well-proportioned, prominent, obtusely pointed spire. Body beneath large and gibbous, with no perceptible fold on the columella. Aperture regularly ovate, angular behind, without enamel on the left margin, rather more than two-thirds the length of the shell.

Length of axis nine-twentieths of an inch ; breadth one-fourth of an inch.

Found on Mount Kea, at an elevation of 7000 feet, Hawaii, Sandwich Islands.

Almost exactly like *S. ovalis*, Gould, but a little more corpulent. It is less elongated than *S. pudorina*, more shining, and differently coloured.

SUCCINEA MODESTA (Gould).

Testa mediocris, ovata, tenuis, nitens, diaphana, stramineo-cornea, tenuiter striata, et lineis interruptis volventibus arata, subtus ventricosa : spira reflexa, anfractibus tribus, ventricosis : apertura rotundato-ovata ; columellâ arcuatâ, incrassatâ, sub-perforatâ ; plicâ conspicuâ.

Succinea modesta, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 186. Nov. 1846. Expedition Shells, 29.

ANIMAL small, fawn-coloured, minutely annulated with dark colour about the neck, radiated posteriorly, margin paler ; tentacles small, with a dark stripe running backwards from them.

SHELL of small size and regular proportions, regularly ovate, the spire prominent and somewhat reflexed, but conforming to the other outlines. It is thin and transparent, smooth and shining, of a pale golden-green colour, with delicate lines of growth and occasional vestiges of revolving lines, which, however, never seem to be complete. Whorls three, regularly rounded; body beneath ventricose, with a distinct flexure at the umbilical region, so that the columellar margin is prominent and thickened at that part; still higher up is the regular columellar fold. Aperture rounded-ovate, three-fourths the length of the shell.

Length of axis one-third of an inch; breadth two-ninths of an inch.

Found at Tahiti and Eimeo, Society Islands, and also at Upolu, Samoa Islands.

Like a small *S. campestris*, Say. Differs from *S. venusta* by its shorter spire, pale greenish colour, and more arcuated columella.

Figure 24, the aperture, 24 *a*, profile of the shell, and 24 *b*, side of the shell with the animal, twice the natural size; 24 *c*, natural size.

SUCCINEA MAGELLANICA (*Gould*).

Testa parva, tenuis, subflexilis, lucida, nitida, intensè virens, rotundato-ovata: spira brevis, acuta, anfractibus tribus, suturâ profundâ discretis, ultimo amplo, ventricoso: apertura ovata; margine columellari reflexiusculo, callo tenui supernè munito.

Succinea Magellanica, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 185. Nov. 1846. Expedition Shells, 29.

ANIMAL much too large for the shell; foot broad, light brown underneath; head and neck dark brown, passing into rufous brown on the sides, and into yellowish on the margin of the foot; the sides are marked by numerous diverging lines, extending from the collar to a furrow just above the margin of the foot; from this marginal furrow lines pass perpendicularly to the margin of the foot; cervical tentacles long and robust, oral ones very short. Respiratory orifice very small.

Situated at the right posterior third of the collar, which is very thick and fleshy.

SHELL small, thin, delicate, and somewhat flexible, of a short, ovate form, and a bright leaf-green colour. The lines of increment are conspicuous, somewhat irregular, and sometimes there are distant, interrupted, revolving striæ. Whorls three, very convex, and separated by a deep suture, the two upper ones forming a short, acute spire; the last ample, ventricose. Aperture ovate, rather acute posteriorly; the columellar margin slightly reflected, and the extremities of the lip united across the penultimate whorl by a thin callus.

Length of axis one-third of an inch; breadth two-ninths of an inch.
[J. P. C.]

Found by Mr. Couthouy, at Tierra del Fuego, who states that it is abundant in moist places around Orange Harbour.

It is a small, remarkably short and ventricose species, conspicuous also for its deep green colour. Some specimens are much more elongated than others. It is interesting from its habitat, and is the only antarctic species yet known.

Figure 22, front, and 22 *a*, profile of the shell, enlarged; 22 *b*, the animal crawling with the shell, also enlarged; 22 *c*, natural size.

SUCCINEA MANUANA (Gould).

Testa parva, ovata, ventricosa, tenuis, sub-opaca, straminea, longitudinaliter striata et transversè sparsim rugosa: spira obtusa, exserta, anfractibus duobus cum dimidio, ventricosis, suturâ profundâ discretis: apertura ovato-rotundata, peristomate ad columellam minimè reflexo; regione umbilicali depressâ, sinuosâ.

Succinea Manuana, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 185. Dec. 1846. Expedition Shells, 29. PFEIFFER; Monog. ii. 520.

SHELL small, thin, ovate, rather opaque, pale straw-coloured, faintly tinged with roseate, striæ of increment rather coarse, with a few trans-

verse wrinkles. Spire exerted, tip obtuse, whorls two and a half, ventricose, separated by a deep suture, the apical one buried in the following one. Aperture rounded-ovate, region of the columella notably sinuous, almost umbilicated; lip thin, slightly reflexed.

Length of axis one-third of an inch; breadth one-fifth of an inch.

Inhabits the island of Manua, near the Society Islands, where it was collected by Mr. Couthouy.

A small, plump species resembling *S. Magellanica*, but still more ventricose, and distinguished from it by its pale colour and opaque structure. It is also closely allied to *S. venusta*.

Figure 23, the aperture, and 23 *a*, profile view of the shell, magnified; 23 *b*, natural size.

SUCCINEA CADUCA (*Mighels*).

Testa parva, ovato-turrita, pallidè virens, sub-opaca, impolita, striis incrementalibus confertis, conspicuis insculpta: spira anfractibus tribus cum dimidio ventricosis; suturâ profundâ: apertura ovata, dimidiam longitudinis testæ aliquid superans; columellâ nec sinuatâ, nec callosâ.

Succinea caduca, MIGHELS; Proceed. Boston Soc. Nat. Hist., ii. 21. Jan. 1845. PFEIFFER; Monog. Helic. viv. ii. 519.

SHELL small, turreted ovate, somewhat reflexed, thin, semi-transparent, of a pale, faded green colour, the surface deadened by crowded, rather loose lines of growth. Whorls three and a half, rounded, the last one sub-globose, the others separated by an impressed suture, and forming an acute, prominent spire. The aperture is about five-eighths the length of the shell, small, broadly ovate; the columellar portion of the body is large and rounded, not enamelled, and without a conspicuous, columellar fold.

Length of axis three-tenths of an inch; greatest breadth three-twentieths, lesser breadth one-eighth of an inch.

Inhabits the Sandwich Islands, whence it was obtained and described by Dr. J. W. Mighels. It was also found by Mr. Couthouy on Mauna Kea, at an elevation of 7000 feet; and as no figure of it has ever been given, it was deemed proper to introduce it here.

The shell has also much the aspect of a *Limnea*, and would be with difficulty distinguished from *S. avara*. It is also allied to *S. canella*, but it is less broadly ovate, more slender, greener, and the columellar region is quite different.

Figure 30, the front, and 30 *a*, the profile of the shell, enlarged; 30 *b*, natural size.

SUCCINEA CANELLA (*Gould*).

Testa parva, sub-solidâ, opaca, ovata, impolita, cinnamomea, leviter striata: spira conspicua; anfractibus tribus, ventricosis, suturâ valdè constrictâ discretis: apertura parva, ovato-rotunda; peristomate incrassato, posticè sub-continuo; columellâ arcuatâ, haud plicatâ.

Succinea canella, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 184. Nov. 1846. Expedition Shells, 29. PFEIFFER; Monog. Helic. viv. ii. 519.

SHELL small, short ovate, ventricose, composed of three whorls, of which the last is globular-ovate and moderately large, and the others form a well-developed spire, and are nearly disjoined from each other by a very profound suture. The surface is longitudinally marked with fine crowded lines, and has a dead, rusty-yellow colour, without lustre. The aperture is small, rounded-ovate, and somewhat contracted, the extremities of the lip having a tendency to become continuous; the columellar portion of the body of the shell is very small, and covered with callus, the outer lip returning downwards upon it; it is sharp, and without perceptible fold. Within, it is smooth and shining.

Length of axis one-third of an inch; breadth two-ninths of an inch.

Inhabits the island of Maui, Sandwich Islands.

Much like *S. avara*, Say, and *S. caduca*, Mighels; it is, however,

less green, more inflated in its form, and with a shorter aperture, and smaller body whorl than the latter. It has the size, but not the colour or columella of *S. manuana*.

Figure 20, aperture, and 20 *a*, profile of the shell, magnified; 20 *b*, natural size.

SUCCINEA RUSTICANA (*Gould*).

Testa-elongata, ovato-conica, tenuis, pallidè virens, impolita, lineis incrementalibus inequalibus et crassis striata, subtus convexa: spira acuta, anfractibus tribus convexiusculis: apertura ovata, quadrantes tres longitudinis adequans; columellâ arcuatâ, perspicuè plicatâ.

Succinea rusticana, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 187. Dec. 1846. Expedition Shells, 31. PFEIFFER; Monog. ii. 523.

SHELL elongate, ovate-conical, rather large, thin, and fragile; pale greenish horn-colour, surface rude and without lustre, coarsely and irregularly marked by the lines of growth. Spire acute, of three or more moderately convex whorls, separated by a well-impressed suture, the last whorl large and long, narrowing towards the base; body portion of the face of the shell moderately large. Aperture ovate, three-fourths the length of the shell; fold of the columella distinct.

Length of axis half an inch; breadth one-fourth of an inch.

Inhabits Oregon.

Somewhat related to *S. pudorina*, in form, but very different in colour.

Figure 29, front of the shell; 29 *a*, side of the shell, with the animal; 29 *b*, profile of the shell.

SUCCINEA CROCATA (*Gould*).

Testa pinguis, sub-solidâ, sub-opacâ, ovato-globosa, saturatè crocea, lineis

incrementi exilibus et interdum lineis inordinatis volventibus striata : spira brevis, acuta, anfractibus vix tribus, convexis, suturâ profundissimâ discretis, ultimo ventricoso : apertura magna, rotundato-ovata ; columellâ carinatâ sub-incrassatâ, haud sinuosâ : intus calcarea.

Succinea crocata, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 183. Nov. 1846. Expedition Shells, 29. PFEIFFER ; Monog. Helic., ii. 520.

ANIMAL small for the shell, of a delicate rose-colour with straw-coloured reflections, having an umber stripe along the median line, and an oblique one on each side directed towards the oral tentacle ; sides marked with delicate diverging furrows.

SHELL. A very large, inflated species, quite solid and nearly opaque, of a deep saffron-colour ; the surface has but little lustre, is marked with fine and regular lines of increment, and sometimes with irregular, interrupted, revolving ridges and furrows. There are scarcely three whorls, the first two of which are convex, and separated by a very deep suture, and form a short, well-developed spire ; the last is large and greatly inflated. The aperture is large, rounded ovate, the lip passing round without any sinuosity at the columella, and but slightly thickened there.

Length of axis five-eighths of an inch ; breadth half an inch.

Found abundantly in very moist and in shady places, at an elevation of 1200 feet, at Upolu and other islands of the Navigator Group.

This remarkable shell may be readily known by its large size, inflated form, and its peculiar colour. The spire is remarkably contorted.

Figure 21, the front ; 21 *a*, profile of the shell ; 21 *b*, the animal with the shell.

NANINA RUBRICATA (*Gould*).

Testa globoso-conica, solida, vix perforata, suprâ nitida, rufo-castanea, striis radiantibus gregatim dispositis et striis volventibus decussata,

infra glaberrima, livido-castanea, ad centrum declivis: spira anfractibus sex convexis, amplis; suturâ submarginatâ: apertura semilunaris; fauce lividâ; labro simplici, ad columellam reflexo, albo.

Helix (Nanina) *rubricata*, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 178. Nov. 1846. Expedition Shells, 25.

ANIMAL corpulent, the back and the two lobes of the mantle with bright crimson reflections, the sides shaded with lilac, darker on the neck, where there is a distinct, central white line passing over the head between the tentacles, and two oblique lateral ones directed to the oral tentacles, like the reins of a bridle; there is a distinct submarginal furrow, and there are marginal radiations; surface irregularly and delicately reticulated; tentacles long and tapering, enlarged at base, lilac; anal lappet very long.

SHELL globose-conical, rather solid; beneath, it is highly polished and shining, of a livid, brownish olive-colour; above, reddish chestnut brown. The lines of growth are fine and sharp, somewhat grouped into little waves resembling coarse and rather regular striæ; and these are decussated by revolving lines which do not extend much below the periphery of the shell. Whorls six, well rounded; suture deep, and very slightly margined. Aperture rather small, semilunar, the throat coloured like the exterior, or a little glaucous; lip simple and sharp, slightly reflected and white as it passes the umbilicus. Umbilical region excavated, with a very minute perforation.

Diameter one inch; axis three-fifths of an inch.

Inhabits Lebouka, Feejee Islands.

In shape and size it is like *H. zaleta* and *H. irregularis*; but in all other respects it is like *H. velutina*, Sowb., to which it is very closely allied. Perhaps it is *H. Nouleti*, Le Guillou.

Figure 66, the animal, with the shell; 66 *a*, portion of the shell magnified to show the sculpture.

NANINA LURIDA (*Gould*).

Testa globoso-conica, depressa, glaberrima, nitida, livido-castanea, infrà pallescens, ad umbilicum minutum declivis: spira anfractibus sex convexis, radiatim et obtusè striatis, ultimo prope aperturam subangulato; suturâ impressâ, marginatâ: apertura lunata, fauce lividâ; labro acuto, ad umbilicum reflexo, albo.

Helix lurida, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 179. Nov. 1846. Expedition Shells, 25. PFEIFFER; Monog. Helic., i. 47.

SHELL. globose-conical, depressed, moderately thick, polished and shining, with only rather distant, obtuse, radiating striæ above. Colour lurid, or chestnut diluted with olive; beneath becoming centrally paler, until at the umbilicus it is nearly straw-coloured. Whorls six, convex, the last whorl somewhat angulated towards the aperture. Suture well impressed, with a marginal impressed line. Aperture semilunar, the throat livid; lip simple and sharp, slightly reflected at the umbilicus, which is very minute; central region excavated beneath.

Diameter one inch; axis half an inch.

Inhabits the Feejee Islands.

Very similar to *H. rubricata*, which, however, is rather larger, more solid and globose, darker coloured. It differs essentially in the want of revolving striæ, its carinated periphery, and the light colour above the umbilicus. It groups with *H. velutina*, Sowb., and doubtless belongs to NANINA.

Figures 68, 68 *a*, 68 *b*, three views of the shell.

NANINA CASCA (*Gould*).

Testa tenuis, depresso-globosa, nitida, pallidè stramineo-virescens, arcte umbilicata: spira anfractibus quinque haud turgidis, striis incrementi obsoletis: suturâ haud impressâ, marginatâ: apertura semilunaris; labro simplici, acuto, ad umbilicum paulum reflexo.

Helix calva, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 179. Nov. 1846. Expedition Shells, 25. PFEIFFER; Monog. Helic. Viv., i. 41.

SHELL thin, depressed globose, highly polished, of a pale cinereous olive-colour, somewhat inclined to flesh-colour, paler beneath. Whorls five, not turgid above, but arranged so as to present a regular dome-shaped convexity, their boundary being faintly indicated by the double suture. The lines of growth are scarcely perceptible, except near the termination of the outer whorl. Beneath, this whorl is turgid, rounding off into a very small, fissure-like perforation, in front of which is a slight reflection of the columellar portion of the lip. Aperture semilunar, the lip simple and very sharp.

Diameter four-fifths of an inch; axis half an inch.

Inhabits the Feejee Islands.

Similar to *H. lurida*, but smaller and lighter-coloured, and is plainly distinguished by its smooth, shining, rounded spire, similar to the summit of *H. Moricandi* or *H. lychnuchus*. This must also be a NANINA. The name originally applied by me having been preoccupied, I have substituted the present.

Figure 69, the shell above; 69 *a*, the profile; 69 *b*, basal view.

NANINA FRICATA (Gould).

Testa rotata, tenuis, viridi-cornea, supernè convexiuscula, liris crebris radiantibus interdum furcatis insculpta, infernè glabrata, umbilico lato, profundo, infundibuliformi perforata: spira anfractibus quatuor cum dimidio; suturâ impressâ: apertura rotundata; labro simplici.

SHELL rotate, thin, greenish horn-colour, a little convex above, and marked with rather crowded but distinct ridges in the direction of the lines of growth, many of which bifurcate towards the periphery, where the ridges disappear and leave the basal face polished, or reappear within the umbilicus; umbilicus large, penetrating to the summit and gradually decreasing with each whorl; aperture rather large, circular, except where interrupted by the penult whorl; lip simple: whorls

four and a half, very little convex, separated by a well-impressed suture.

Diameter seven-tenths of an inch ; axis one-third of an inch.

Found by Mr. Drayton, at Illawarra, New South Wales.

Its lower face is almost precisely that of *H. olivetorum*, but the shell is more delicate, and the upper surface ridged with elevated lines like *H. lucubrata*, many of which bifurcate, a character I have not observed on any other species.

NANINA SCORPIO (*Gould*).

Testa rotundata, depressa, rubro-castanea, fasciis radiantibus atro-purpureis tessellata, subtus haud convexa: spira depressa, anfractibus quatuor cum dimidio convexis.

Helix (Nanina) *scorpio*, GOULD ; Proceed. Bost. Soc. Nat. Hist., ii. 178. Nov. 1846. Expedition Shells, 24. PFEIFFER ; Monog. i. 431.

ANIMAL elongated, lilac-coloured, with crimson and purple reflections, a very distinct submarginal ochreous line, and with the marginal limbus radiately wrinkled ; a dark bridle line passes from under the shell on the neck, down each side, to the oral tentacles. Tentacles elongated. The anal lappet is very long, and besides this, there are six other lappets, arranged on either side of the median line in three pairs. Surface irregularly reticulated.

SHELL discoidal, ground-colour mahogany, with quadrate tessellations of slate-colour. Spire slightly elevated, of about four and a half convex whorls ; not convex beneath.

Diameter three-fifths of an inch ; axis two-fifths of an inch.

Inhabits the Feejee Islands. *Drayton*.

The above characters were drawn from the figure of a shell (the original not having been found) which looks somewhat like *Cyclostoma*

tigrinum. Its inhabitant is most peculiar; having, besides the usual anal lappet of *Nanina* covering the mucus-pore, six smaller ones. When these are erect, the animal has somewhat the aspect of a scorpion. Perhaps the checkered colouring of the figure is derived from the colours of the animal within, showing through a transparent shell.

Figures 67, 67 *a*, two views of the animal, with the shell; 67 *b*, the mucus-pore enlarged.

NANINA IRRADIATA (*Gould*).

Testa conico-globosa, tenuis, imperforata, albida, suprà purpureo radiatim tessellata, lineis incrementi acutis confertim striata, subtus rotundata: spira anfractibus sex convexis, ultimo sub-angulato: apertura transversa, lunata; labro acuto, ad columellam incurvato, vix reflexo.

Helix (*Nanina*) *irradiata*, GOULD; Proceed. Bost. Soc. Nat. Hist., ii. 178. Nov. 1846. Expedition Shells, 25. PFEIFFER; Monog. Helic. Viv. i. 29.

ANIMAL pale pea-green, with ochreous reflections on the neck. Its shape is nearly uniform throughout, truncated obliquely at extremity, where there is a mucus-pore. Tentacles very long, and of inferior size; lateral line very distinct along the middle of the sides, rising retrally; above this, finely granulated; beneath thickly fringed with radiating lines.

SHELL small, globose-conic, thin, imperforate, white, checkered above with radiating purplish-brown or chestnut stripes. Whorls six, rather convex, covered with crowded, minute, sharp lines of growth, and with the periphery slightly angular. Suture well marked. Aperture transverse, lunate, the columellar portion continuing its circular curve as it joins the penult whorl; lip simple and sharp, a little flattened on the left side.

Diameter one-fourth of an inch; axis three-eighths of an inch.

Found by Mr. Brackenridge at the Bay of Islands, New Zealand.

A singularly coloured shell, in shape more like *H. cubensis*, Pfeiffer,

than any which I recollect. The colours are arranged somewhat like those on *Bulimus vexillum*.

Figure 65, shell with the animal; 65 *a*, the shell above, and 65 *b*, the base of the shell, enlarged; 65 *c*, natural size.

HELIX INTAMINATA (*Gould*).

Testa depresso-globosa, imperforata, tenuis, translucida, alba, epidermide tenuissimo stramineo induta; spira depressa, anfractibus quatuor convexiusculis, ultimo subangulato: apertura rotundata, ampla; columellâ planulatâ, acutâ; labro everso.

ANIMAL greatly developed, and elongated so as to equal three diameters of the shell in length. Its colour is white, with sky-blue reflections. There is a dorsal line of blue on the neck, and one passes back from each tentacle. The shell is placed far back upon the animal.

SHELL depressed, globose, imperforate, thin and translucent, of a pure white, covered with a very delicate straw-coloured epidermis. There are about four whorls, forming a low, nearly flat spire, the last faintly angular at the periphery. Aperture large, rounded; the columella flattened, acute edged; lip everted; beneath tumid, imperforate.

Diameter one inch; axis two-thirds of an inch.

Obtained from a tree at the island of Mangsi, Straits of Balabac.

I am somewhat in doubt as to the validity of this species. In shape it is like *H. intorta*, excepting that the last whorl above the columella has less altitude, and there are no revolving dusky bands. From *H. Valenciennesii* it differs in being less globose, in having a thinner columella, differently directed, and no sutural line.

Figure 47, shell with the animal.

HELIX VANCOUVERENSIS (*Lea*).

Testa planulata, latè umbilicata, luteo-viridescens: spira anfractibus quinque subtus rotundatis: apertura transversa, subcircularis, supernè depressa; labro infernè sub-reflexo, supernè simplici; columellâ brevi, callosâ.

Helix Vancouverensis, LEA; Trans. Amer. Philos. Soc., vi. 87, pl. 23, f. 72; DE KAY, Nat. Hist. New York, 45; PFEIFFER, Symbolæ, ii. 41; Monog. Helic. Viv., i. 200; BINNEY, United States Land Mollusks, ii. 266, pl. 20.

Helix concava, BINNEY; Bost. Journ. Nat. Hist., iii. 372, pl. 14.

ANIMAL abbreviated posteriorly, sub-cylindrical, very light-coloured, giving a straw-coloured reflection, sides pearly, marked with longitudinal lines of coarse, elongated, squamæform papillæ, about eight or ten on each side, diminishing in size towards the margin.

This shell has sometimes been considered as a variety of *H. concava*, but since a larger number of specimens have been examined, the differences between them are so constant that no doubt can longer exist. It is always of a darker colour, and nearly twice as large. It is one of many instances where different species of analogous forms are found on the two slopes of the Rocky Mountains.

Found by Mr. Drayton and Dr. Pickering, rather common along the Columbia River, Oregon.

Figure 37, the shell with the animal.

HELIX STRIGOSA (*Gould*).

Testa orbicularis, depressa, scabrata, latè umbilicata, cinereo-grisea vel fuscescens, fasciis linearibus volventibus pallidè fuscis interdum subtus notata: spira anfractibus quinque convexiusculis; ultimo angulato et prope aperturam deflexo: apertura circularis; labro simplici, continuo.

Helix strigosa, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 167.

Aug. 1846. Expedition Shells, 18. BINNEY; Land Mollusks of United States, ii. 210. PFEIFFER; Monog. Helic. Viv., i. 121.

SHELL orbicular, slightly and about equally convex above and beneath, broadly umbilicated, surface irregular, and roughened above by indentations and coarse lines of growth, and by occasional fine revolving lines; smooth and shining beneath. Colour ashy-gray, somewhat mottled with dusky or altogether rusty-brown above, with usually a single faint revolving band on the middle of each whorl, and often with numerous bands unequal in size and distance beneath. Whorls five, separated by a well-defined suture, moderately convex, carinated at its commencement and deflexed near the aperture, which is circular, with the lip simple, and very nearly continuous.

Diameter nine-tenths of an inch; axis two-fifths of an inch.

Inhabits along Puget Sound, *Pickering*; Columbia River, *Drayton*.

In form it may be compared, among the shells of this continent, to *H. concava*, and *H. alternata*; but in its opaque and rugged aspect, and in most of its characters, it nearly resembles some of the varieties of *H. alpina*, of Europe (*H. Schmidtii*, *H. tigrina*), but that species is more elevated, has the umbilicus smaller, the tip reflexed, and no revolving bands.

Figures 41, 41 *a*, 41 *b*, three views of the shell.

HELIX SPORTELLA (*Gould*).

Testa planulata, fragilis, nitida, luteo-cornea, subtus concava, latè umbilicata, lineis incrementi conspicuis et lineis volventibus subtilissimis confertim decussata; anfractibus quinque, ultimo magno; suturâ profundâ: apertura rotundata, infrâ subangulata; labro acuto, simplici.

Helix sportella, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 167. Aug. 1846. Expedition Shells, 18. PFEIFFER; Monog. Helic., i. 111.

SHELL much depressed, convex above, concave beneath, sloping into a broad, tunnel-shaped umbilicus, delicate and shining, of a light,

yellowish-green colour. Surface regularly marked with sharp, coarse lines of growth, which are crossed by fine, crowded, revolving lines, that merely cut the summits of the radiating lines, so that to the naked eye the surface appears minutely granulated, but under the lens the raised spaces are seen to be cut into squares. Whorls five, separated by a deep suture, the outer one proportionally large. Aperture nearly circular, a little angular at base, modified by the preceding whorl; lip acute, simple.

Diameter half an inch; axis eleven-fortieths of an inch.

Inhabits Puget Sound, Oregon. *Pickering*.

Much like *H. concava*, Say, which, however, presents a very smooth surface, a smaller and less circular aperture, an umbilicus much broader, as the outer whorl increases less rapidly. I know of no North American species which has the surface similarly decussated. The specimens are immature, and probably the lip is slightly reflected or thickened in adults.

Figures 42, 42 *a*, 42 *b*, three views of the shell; 42 *c*, magnified portion of the surface.

HELIX SPIRILLUS (*Gould*).

Testa parva, planorboidea, tenuis, diaphana, lævis, virescens: spira depressa, anfractibus quinis convexiusculis, arcuè volutatis, ad peripheriam rotundatis; suturâ impressâ: apertura subcircularis; labro albo, reflexiusculo; columellâ callo subdentato munitâ.

ANIMAL almost transparent, of a delicate straw-colour. [J. P. C.]

SHELL small, depressed, slightly convex above, broadly concave beneath, thin, translucent, nearly smooth, of a greenish-drab (watery-green) colour. Spire composed of five slightly convex, closely revolving whorls, separated by a deep suture; periphery rounded beneath, with a broad umbilicus displaying the edges of all the whorls. Aperture nearly circular, extensively modified by the penultimate whorl; lip white, thickened and slightly reflected, retreating as it joins the

penultimate whorl superiorly. A thick callus crosses the penultimate whorl, and is so arranged as to produce an oblique, microscopic tooth at the upper angle of the aperture, in the adult.

Diameter one-fourth of an inch; axis one-tenth of an inch.

Obtained on the mountains beyond the valley of Amançaes (Lima), under stones. [J. P. C.]

This is a miniature *H. concava*, remarkable for the peculiar protrusion of the lip, which is also white and a little thickened. The umbilicus is larger than in *H. pusillus*. It may possibly be *H. trochilionides*, D'Orb., (Amer. Merid. Moll., 251, pl. 27.)

HELIX LYRATA (*Couthouy*) Gould.

Testa minuta, depressa, rufo-cornea, umbilicata: spira anfractibus quatuor cylindraceis, et striis elevatis confertis lyratis; suturâ canaliculatâ: apertura circularis; labro simplici.

Helix lyrata (Couthouy, MS.,) GOULD; Proc. Boston Soc. Nat. Hist., ii. 167. Aug. 1846. PFEIFFER; Monog. Helic. Viv., i. 101. Expedition Shells, 19.

ANIMAL dark brown on the back, passing into slate-colour down the sides; beneath pale slate-colour. Body covered anteriorly with lozenge-shaped granulations. Tentacles moderately long, rather stout, eyes large. Respiratory orifice very small, near the median margin of the collar.

SHELL minute, depressed, brownish horn-colour, somewhat mottled with cinereous rays. Suture channelled: Whorls four, or a little more, nearly cylindrical, their surface delicately barred with minute, crowded, rib-like striæ. Aperture nearly circular, modified by the penultimate whorl; lip simple. Umbilicus of moderate size, but distinctly showing the rounded walls of all the whorls.

Length of the axis one-twentieth of an inch; diameter one-fifth of an inch.

Found by Mr. Couthouy near Orange Harbour, Tierra del Fuego.

Both this species and *H. saxatilis* were obtained upon the very summit of the highest mountain in the neighbourhood of Orange Harbour, about six miles inland, and a mile or more to the north-east of the remarkable peak called the Sentry-box. They were found exclusively under small, dry stones, about the roots of a species of *Usnea*, which is almost the only vegetation there. None were found under stones where there was any amount of moisture. Such as were placed in a jar with moist moss died in two or three days, while others, tightly enclosed in a dry box with dry moss, continued alive and active for a fortnight. They soon closed the aperture with a thin, brown epiphragm, but on exposure to the sun, most of them began actively to crawl about, though some resolutely adhered to their preparation for winter quarters. The epidermis is thick and the shell delicate, as is always the case in cold regions.

The summit where these snails are found has as bleak and desolate an aspect as could well be imagined. The rocks are heaped up in irregular and jagged masses, and in some places we crossed from one to the other on the hands and knees, over narrow ridges composed of ragged blocks, which often, as we reached to them for support, rolled away down the precipice a thousand feet. The estimated height of the peak is 1600 feet; and none of the snails were found on searching 200 feet below. [J. P. C.]

It is about the size and colour of *H. rupestris*, but more depressed, and with a less expanded umbilicus. It agrees nearly with D'Orbigny's *H. costellata*, from Buenos Ayres (Amer. Merid. 252, part 26, f. 6-9), but it is not so large, and the striæ are finer.

Figure 34, animal with the shell; 34 *a*, profile, and 34 *b*, base of the shell, enlarged; 34 *c*, natural size.

HELIX PAUXILLUS (Gould).

Testa minuta, tenuis, depressa, suprâ obliquè striata, albido-virens, infra viridior, sub-polita, perforata: spira anfractibus quatuor sub-planulatis; suturâ profundâ: apertura circularis; labro simplici.

Helix pusillus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 171. Aug. 1846. Expedition Shells, 19.

SHELL small, depressed, thin, rather opaque, pale green above, darker below, coarsely striated above, less so below, where may be seen, by a lens, vestiges of revolving striæ. Whorls four, or a little less, nearly flat above, separated by a deep suture, the outer one a little declivous, rounded at periphery: beneath convexly rounded into a rather large umbilicus. Aperture oblique, circular, modified by the penult whorl; lip simple.

Axis three-fortieths of an inch; diameter seven-fortieths of an inch.

Obtained by Mr. Drayton, on the mountains of East Maui, Sandwich Islands.

Scarcely to be distinguished from *H. electrina*, Gould, in size and form. It is, perhaps, a little more depressed, less lucid and deep-coloured, and is more coarsely striated above and beneath, while *H. electrina* is polished beneath. It is also like *H. spirillus*, but has a much smaller umbilicus. The name first given is preoccupied.

Figure 46, the shell above; 46 *a*, profile; and 46 *b*, shell from below, enlarged; 46 *c*, natural size.

HELIX ZICZAC (Gould).

Testa parva, rotundata, depressa, stramineo-albida, lineolis obliquis fulminantibus fuscis picta, et laminis acutis confertis, reflexis, pilosis, lyrata; subtus convexa, umbilico magno scalariformi perforata: spira anfractibus sex convexis, angustis: apertura subcircularis, ad basim subangulata; labro simplici, propè umbilicum reflexo.

Helix ziczac, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 166. Aug. 1846. Expedition Shells, 17. PFEIFFER; Monog. Helic., i. 116.

SHELL small, rather solid, depressed, of a pale straw-colour, variegated with very numerous fine, dusky, zigzag lines, the general direction

of which is oblique to the axis. Whorls six, narrow and closely convoluted, crossed with fine, crowded, recurved laminæ, which curve gracefully like an S in their course, and bear fine, scattered hairs. Above, they form a low, dome-shaped spire. Suture profound. Beneath convex, with a large, deep umbilicus, in which all the whorls are beautifully displayed. Aperture nearly circular, modified by the penult whorl, a little angular at base, so that the columellar portion rises nearly vertically, and is a little reflexed.

Diameter three-tenths of an inch ; axis one-sixth of an inch.

Found by Dr. Pickering, in a crater near Taiaimi, New Zealand.

A very beautiful and remarkable shell, in its markings, unlike any other I know, excepting *H. dissimilis*, D'Orbigny (Amer. Merid. 247, pl. 26, f. 18-21), which much resembles it, but it is larger, more marked in dots, and is not described as hairy. In general form, striation, umbilicus, &c., it is like *H. striata*, Drap., but somewhat more depressed.

Figure 44, the shell above ; 44 *a*, view of the side ; 44 *b*, view of the base ; 44 *c*, magnified view of the sculpture.

HELIX SAXATILIS (*Couthouy*) *Gould*.

Testa parva, sub-globosa, lucida, viridis, infrà convexa, umbilico modico perforata, leviter striata : spira anfractibus vix quatuor cylindraceis, citò crescentibus ; suturâ canaliculatâ : apertura sub-orbicularis, ampla ; labro simplici, ferè continuo.

Helix saxatilis, (*Couthouy*) MS., GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 171. Aug. 1846. Expedition Shells, 19. PFEIFFER ; Monog. Helic. Viv., i. 84.

ANIMAL "bright black, covered with fine granulations ; foot beneath dark slate-colour. Body elongated, rounded, separated from the foot by a fine beaded ridge in a slight furrow. Head abrupt ; upper tentacles long and slender, inferior ones about one-third their length.

Respiratory orifice large, on the right side behind the collar, which is thick and of a dark slate-colour. Near the extremity of the foot above, is a sort of truncation, in which is situated a mucus-pore."

SHELL small, fragile, thin, of a leaf-green colour, depressed above, rounded below, delicately striated. Suture deeply channelled. Whorls less than four, rounded and rapidly enlarging. Aperture nearly circular, being but little modified by the penultimate whorl; lip simple; umbilicus rather small. [J. P. C.]

Length of axis one-tenth of an inch; diameter one-fourth of an inch.

Found by Mr. Couthouy, on the mountains near Orange Harbour, Tierra del Fuego, in company with *H. lyrata*.

Resembles in general *H. lucida*, and is remarkable for its globular form and fresh green colour. For its locality and habits see the remarks under *H. lyrata*, page 40.

Figure 33, animal with the shell, enlarged; 33 *a*, profile of the shell; and 33 *b*, base of the shell, enlarged; 33 *c*, natural size.

HELIX CICERCULA (*Gould*).

Testa depresso-globosa, tenuis, sub-opaca, imperforata, albido-virescens, striis incrementi conspicuis et striis volventibus sparsis insculpta, infrà rotundata; foveâ centrali modicâ: spira anfractibus quinque convexis, ultimo angulato: apertura lunata; labro simplici; columellâ supernè vix reflexâ.

Helix cicercula, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 171. Aug. 1850. Expedition Shells, 20. PFEIFFER; Monog. Helic. Viv., 39.

SHELL sub-orbicular, depressed, thin, slightly diaphanous, of a pale grayish-green colour, marked with rather distinct, irregular lines of growth above and beneath, and with a few faint, irregular, revolving lines. Whorls five, rather convex, separated by a well-marked suture, and forming an obtuse, depressed spire. Periphery with an

acute, slightly developed angle. Beneath convexly rounded, with a small, rather deep umbilical pit. Aperture lunate, lip simple, very slightly reflexed at its central junction.

Diameter one-fourth of an inch ; axis three-twentieths of an inch.

Inhabits the mountains of Hawaii. *Drayton, Brackenridge.*

Its general aspect is that of *H. subbrutilla*, Mighels, but it is more elevated, more opaque, less fragile, the incremental lines are coarser, with a few revolving lines ; the periphery is more rounded and less carinated. The whorls are more convex, with a deeper suture, and the lip is less spread over the umbilical pit. The colour is of a more pale pea-green. Beneath, the whorl is much more rounded, the umbilical pit is deeper, and there is no semblance of a columellar twist.

Figure 73, the shell above ; 73 *a*, the side ; and 73 *b*, the base of the shell, enlarged ; 73 *c*, natural size.

HELIX CRYPTOPORTICA (Gould).

Testa parva, orbiculari-depressa, ad apicem acuta, tenuis, pellucida, nitida, luteo-virescens, leviter striata ; infrà rotundata, imperforata ; foveâ centrali parvâ : spira anfractibus quinque cum dimidio convexiusculis, ultimo carinato ; suturâ impressâ, marginatâ : apertura lunata ; labro simplici ; columellâ supernè admodum intortâ, sinum centralem angustum reconditum formante.

Helix cryptoportica, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 171. Sept. 1846. Expedition Shells, 20. PFEIFFER ; Monog. Helic. Viv., i. 39.

SHELL small, depressed, thin, pellucid, shining, of a pale yellowish-green colour, delicately striated : spire depressed, apex acute, composed of five or more rather convex whorls, with a well-defined, margined suture, and the outer whorl with a delicate, acute keel. Beneath, convexly rounded, with a small, shallow, central pit. Aperture lunate, lip simple, columellar portion oblique, and at its superior junction it

is suddenly twisted inwards, forming a narrow channel, nearly concealed, just under the penultimate whorl.

Diameter one-fourth of an inch; axis one-sixth of an inch.

Inhabits the mountains of Oahu, Sandwich Islands.

This shell belongs to a group in which the specific marks are very faintly pronounced. It has a general resemblance to *H. cicercula*, but is somewhat larger, clearer, less globose, and by a careful examination of the aperture, a peculiar channel at the top of the columella, almost microscopic, indeed, will leave no doubt. The umbilical region is also more striated. To *H. cultrata* it is also closely allied. It still more nearly resembles *H. subrutila*; but that shell has microscopic revolving lines, is more depressed and somewhat sharply angular at periphery, has not quite five whorls, and the columella joins the whorl above without the intortion which forms the little umbilical channel of this shell. It is smaller and less pyramidal than *H. Tongana*.

Figures 72, 72 *a*, 72 *b*, three views of the shell, enlarged; 72 *c*, natural size.

HELIX PERTENUIS (*Gould*).

Testa minuta, subglobosa, pellucida, nitidissima, viridi-aurea, imperforata: spira depressa, anfractibus quatuor cum dimidio, convexis, ultimo amplo, ad peripheriam angulato, infrà sulcis remotis radiato: apertura ampla, lunata; labro simplici.

Helix pertenuis, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 172. Sept. 1846. Expedition Shells, 172. PFEIFFER; Monog. Helic., i. 38.

SHELL small, pellucid, subglobose, depressed above, more convex and imperforate beneath, of a gilded green colour, very minutely striated, and divided into segments by gooseberry-green radiating lines. Spire depressed, whorls four and a half, convex, the outer one large, and obtusely angular at the periphery; suture well defined. Aperture ample, rounded-lunate; lip simple.

Diameter one-eighth of an inch ; axis one-tenth of an inch.

Inhabits Metia, or Aurora Island. *Couthouy*.

A small, pellucid shell, somewhat like *H. electrina*, but more globular. It is of the same size as *H. cicercula*, but is more fragile, has one whorl less, a more depressed spire, and a different aperture.

Figures 60, 60 *a*, 60 *b*, three views of the shell, enlarged ; 60 *c*, natural size.

HELIX CULTRATA (Gould).

Testa parva, orbicularis, depressa, glaberrima, lucida, fusco-viridis, infrà rotundata, in foveam umbilicalem deversa, imperforata : spira anfractibus quinque convexis, ultimo supernè carinato ; apice obtuso ; suturâ marginatâ : apertura angusta, lunata ; labro simplici ; columellâ obliquâ, callosâ, albâ, planulatâ, inflexâ, infernè dentem simulante.

Helix cultrata, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 172. Sept. 1846. Expedition Shells, 20. PFEIFFER ; Monog. Helic. Viv., i. 37.

SHELL small, depressed-orbicular, very smooth and glistening, translucent, of a dusky-green colour. Whorls five, closely arranged, and forming a low, arched spire, the outer whorl carinate superiorly, on the plane of the interior whorls : suture delicate, with a fine line revolving near it. Beneath convex, broadly rounded at margin, and at the centre forming a slight depression. Aperture narrowed, lunate, the lip simple, columellar portion oblique, inflexed, opaque white, forming a broad, flat plate, ending below in a tooth-like process ; callus across the penultimate whorl abundant.

Diameter nine-fortieths of an inch ; axis one-eighth of an inch.

Inhabits Tahiti and Eimeo, Society Islands. *Couthouy*.

A beautiful, smooth, lenticular, dark-green shell, not unlike *H. interna*, Say, distinguished by its curious broad, white, inflected, colu-

mellar lip. This broad callus of the lip may have been simply a torsion at first.

Figure 59, the shell above; 59 *a*, the side; and 59 *b*, the base, enlarged; 59 *c*, the natural size.

HELIX EXÆQUATA (Gould).

Testa parva, discoidea, tenuis, lucida, glabrata, succineo-cornea, ad peripheriam rotundata, infra sub-plana, in foveam centralem deversa: spira anfractibus septem arcuè volutis, supra planulatis, suturâ marginatâ benè impressâ discretis, spiram planam efformantibus: apertura angusta, transversa; labro simplici, portione sinistrâ ferè horizontali, recedente, subreflexâ.

Helix exæquata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 171. Sept. 1846. Expedition Shells, 19. PFEIFFER; Monog. Helic., i. 193.

SHELL small, pellucid, shining, smooth, of a yellowish horn-colour, composed of seven closely convoluted whorls, which are flattened above, so as to form a perfectly level or slightly convex spire; suture deep and margined. Periphery broadly rounded, beneath slightly swollen, and gradually sloping to a rather deep, central pit. Aperture very narrow, most of it lower than the penult whorl, beneath which it extends like a narrow slit to the centre. Lip simple, slightly ascending below, and retreating as it approaches the centre, where it is slightly recurved. In old specimens a well-marked callus unites the extremities.

Diameter seven-twentieths of an inch; axis three-twentieths of an inch.

Inhabits Kauai, Sandwich Islands. *Couthouy*.

A very beautiful and polished symmetrical shell; beneath, it is like *H. interna* and *indentata*.

Figure 61, top of the shell; 61 *a*, the side; and 61 *b*, the base of the shell, enlarged: 61 *c*, natural size.

HELIX CALCULOSA (*Gould*).

Testa parvula, hyalina, fragilis, nitida, lævigata, cornea, globoso-pyramidalis: spira depressa, anfractibus quatuor convexiusculis, ad peripheriam angulata et tenuissimè carinata: infra convexa, regione umbilicali impressâ sed imperforatâ: apertura lunata; labro simplici, margine internâ rotundatâ.

SHELL minute, hyaline, fragile, corneous, depressed globose, pyramidal, shining, smooth; whorls four, convex, with a distinct and closely margined suture, forming a low, obtuse, pyramidal spire: beneath nearly as convex as above, somewhat pitted at the centre, but not perforated: periphery obtusely angular and carinated: aperture rather small, lunate, with the columellar portion forming a pillar of considerable length: lip simple.

Diameter one-tenth of an inch; axis a little less.

Inhabits Tahiti. *Couthouy*.

Like *H. chersina*, Say, but has an angular periphery, though it is less angular than *H. subtilissima*.

Figures 63, 63 *a*, 63 *b*, three views of the shell, enlarged; 63 *c*, natural size.

HELIX SUBTILISSIMA (*Gould*).

Testa minuta, fragilissima, nitidissima, lenticularis, plano-convexa, imperforata: spira planulata, anfractibus quinque planis, arcuè volutis; ultimo acutissimè carinato: apertura — (fracta).

Helix subtilissima, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 177. Nov. 1846. Expedition Shells, 24. PFEIFFER; Monog. Helic., i. 231.

SHELL very fragile, discoidal above, sharply carinated at periphery, obversely conical beneath, imperforate, hyaline. There are five closely revolving, flat whorls, marked with exceedingly fine lines of growth. The aperture is fractured, so as to afford no definite outline.

Diameter one-eighth of an inch ; axis one-sixteenth of an inch.

Inhabits Maui, Sandwich Islands. *Drayton*.

This little pellucid shell, though imperfect, is so well marked by its compressed, lenticular form, sharp carination, and numerous whorls, that I venture to pronounce it a new species.

Figures 62, 62 *a*, 62 *b*, three views of the shell, magnified ; 62 *c*, natural size.

HELIX GRADATA (*Gould*).

Testa parva, planorboidea, tenuis, nitida, rufo-viridis, luteo radiatim variegata, supra depressa, infra acetabuliformis: spira anfractibus quinque convexis, intra umbilicum angulatis, obliquè et confertim striatis et cum striis interruptis volventibus decussatis; ultimo subangulato, versus aperturam deflexo; suturâ canaliculatâ: apertura obliqua, subcircularis; labro acuto, ad umbilicum reflexo.

Helix gradata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 172. Sept. 1846. Expedition Shells, 21. PFEIFFER; Monog. Helic. Viv., i. 104.

SHELL planorboid, convex above, cup-shaped beneath, thin, shining, with coarse, regular, and crowded striæ, crossed by interrupted, equidistant revolving lines. Whorls five, separated by a deeply channelled suture, the outer whorl a little angular at periphery ; beneath sharply angular as it borders the broad umbilicus, and so are each and all the whorls as they present their edge in the vortex : aperture circular or a little transverse, slightly modified by the last whorl : lip simple, somewhat everted at the umbilicus. Colour brandy-red, somewhat rayed by unequal and irregular stripes of pale yellow.

Diameter half an inch ; axis one-fifth of an inch.

Found at the Tonga Islands.

It has the shape and size of *H. striatella*, Anthony, but the umbi-

licus is broader, deeper, and more shelving. The striation and coloration are also quite different. Dr. Pfeiffer has more recently published a different shell under the same name.

Figures 48, 48 *a*, 48 *b*, three views of the shell.

HELIX FORNICATA (*Gould*).

Testa parva, planorboidea, tenuis, dilutè rufa, supra convexiuscula, infra concava, obliquè ordinatim et confertim costato-striata: spira anfractibus quatuor convexis, ultimo ad peripheriam rotundato; suturâ profundâ: apertura transversa, rotundato-elliptica.

Helix fornicata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 172. Sept. 1846. Expedition Shells, 21. PFEIFFER; Monog. Helic., i. 426.

SHELL planorboid, depressed, slightly convex above, concave beneath, and having a rather large, deep, sloping umbilicus, thin and fragile, pale rufous. Whorls four, shining, coarsely and obtusely rib-striate obliquely, the outer one rounded at the periphery; suture deeply impressed. Aperture nearly circular, somewhat transverse-elliptical, the lips united by enamel.

Diameter one-fourth of an inch; axis one-tenth of an inch.

Inhabits the island of Kauai, Sandwich Islands.

A small, dome-shaped shell, marked like *H. striatella*, Say, but more like *H. indentata*, Say, in the form of the spire.

Figures 64, 64 *a*, 64 *b*, three views of the shell.

HELIX RUBIGINOSA (*Gould*).

Testa orbicularis, depressa, ferrugineo-cornea, fusco-tessellata, obliquè costato-striata, latè umbilicata: spira anfractibus sex arcuè volutis; suturâ impressâ: apertura subrecta, lunata; labro simplici; lamellâ unicâ secundum anfractum penultimum intro volvente.

Helix rubiginosa, GOULD : Proceed. Boston Soc. Nat. Hist., ii. 173. Sept. 1846. Expedition Shells, 21. PFEIFFER ; Monog. Helic., i. 187.

SHELL orbicular, depressed, rusty horn-colour, finely checkered with dusky, minutely costate-striate. Beneath broadly umbilicated, displaying all the whorls. Whorls five, closely revolving, higher than broad, rounded ; suture deeply impressed. Aperture not much oblique, semilunar, lip simple. Penultimate whorl with a single lamina revolving in the aperture.

Diameter seven-thirtieths of an inch ; axis three-fortieths of an inch.

Inhabits Kauai, Sandwich Islands. *Couthouy*.

Larger than the other checkered shells of this group. In colour, form, and sculpture it is like young *H. bursatella*, but is still more like *H. striatella*, or like *H. radiata* as to colouring. It is not, like them, carinated.

Figures 49, 49 *a*, 49 *b*, three views of the shell, enlarged ; 49 *c*, natural size.

HELIX BURSATELLA (*Gould*).

Testa parva, per-variabilis, rotundata, conica vel planulata, suprâ maculis fuscis et albidis alternantibus flexuosis tessellata, infrâ cinereo-albida vel flammulis fuscis flexuosis radiata, costis numerosissimis acutis radiantibus lyrata ; subtus convexiuscula, interdum simplex, interdum concentricè striata, nunc radiatim costellata, nunc albida, nunc fusco flammulata : spira anfractibus ad octo extrinsecus excavatis, ultimo carinato ; suturâ impressâ, plerumque marginatâ : apertura parva, transversa ; fauce lamellis septem volventibus instructo, quorum duæ superiores, una columellaris, quatuor remotæ (una suprâ, tres infrâ carinam) ad labium ; labro simplici ; umbilico cavernoso, in junioribus acetabuliformi, in majoribus ad januam parvo, constricto, margine acuto, una cum labio continuo.

Helix bursatella, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 175.

Sept. 1846. Expedition Shells, 22. PFEIFFER; Monog. Helic. Viv., i. 185.

ANIMAL small, pale, lemon-coloured about the head; pearly white posteriorly, obscurely radiated on the side. Tentacles very short and small, with a dark line passing behind each one.

SHELL exceedingly variable in size, form, and colouring. It is small, and essentially characterized by its radiating rib-striæ, checkered with dusky and yellowish, its seven lamellæ revolving within the aperture, but above all, by its peculiar umbilicus. In the young shell this is broad, conforming to the shape of the spire, the presenting edges of the whorls flattened, so as unitedly to form a little cup; but as the last whorls are added, the form of the cavity is reversed, its diameter diminishing till it is at last nearly covered over, presenting only a small opening to the globular cavity, or little purse or pouch, its verge being sharp, and in continuation of the lip.

The shell is small, rather solid, conical or discoid, always marked above with more or less coarse, sharp, radiating, rib-like striæ; of a dusky brown colour, radiately checkered with ashy buff-colour. Beneath, it is either cinereous or mottled with flexuous, radiating pencilings of brown, with or without radiating and revolving raised striæ. The whorls are eight in number, closely coiled, carinated, separated by a distinct suture which is sometimes margined. The aperture is small, transverse, lunate, angular at the periphery; lip simple, and on arriving at the umbilicus it bifurcates, and sends a branch each way around the perforation, thereby forming something like a vertical axial pillar. Of the seven lamellæ revolving in the aperture, one is on the pillar, rather inconspicuous, two on the penult whorl, and four on the outer lip, one above and three below the keel.

The above characters are found combined in every possible manner. The variations in size, colour, solidity, and umbilicus (all the variations), may be reasonably ascribed to differences in age and to the elevation, between two and five thousand feet, at which they were collected.

Two principal varieties may be noted.

a. Large, elevated, conical, solid specimens which are without mottling, rib-like striæ, or revolving lines beneath.

Diameter three-tenths of an inch; axis one-fifth of an inch.

b. Smaller, depressed specimens, more or less coarsely ribbed, striated and mottled both above and below.

Diameter one-fifth of an inch; axis one-tenth of an inch.

Dr. Pfeiffer has given to this form the name of *H. Jacquinoti*.

In some specimens the whorls are somewhat deranged in their volution, so that the inner ones form a flat disc, while the two outer ones are placed one directly above the other. This variety, as well as the shell in an immature stage, have been described as distinct species; but the examination of an extensive series, shows the impropriety of this. Sometimes one or more of the lamellæ are undeveloped. In most specimens there are no revolving striæ, but in some they even predominate over the coarse, radiating lines. Dr. Pfeiffer has recently described this as a distinct species, by the name of *H. coarctata*.

From Tahiti and Eimeo, at 2000 to 5000 feet elevation. *Couthouy*.

Figure 52, shell with the animal; 52 *a*, the aperture, enlarged; 52 *b*, depressed variety with the animal; 52 *c*, the side, and 52 *d*, the base of the distorted variety, enlarged; 52 *e*, natural size; 52 *f*, 52 *g*, 52 *h*, three views of the normal form, enlarged; 52 *i*, natural size; 52 *k*, 52 *l*, views of the young shell, the aperture enlarged; 52 *m*, natural size.

HELIX OBOLUS (*Gould*).

Testa parva, discoidea, deorsum compressa, suprâ planulata, infrâ concava, radiatim minutissimè et inequaliter striata, fusco-ferruginea, piceo tessellata: spira anfractibus quinque cum dimidio, suprâ excavatis, ultimo supernè costato-carinato: apertura sub-rhomboidæ; fauce lamellâ unicâ secundum anfractum penultimum instructâ.

Helix obolus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 175. Sept. 1846. Expedition Shells, 22. PFEIFFER; Monog. Helic., i. 184.

SHELL small, discoidal, very much depressed, flat or concave above, shallow, basin-shaped beneath, with a rib-carina at the periphery, on a level with the upper plane; colour rusty brown, tessellated alternately with dark chestnut brown. Whorls five and a half, separated by a

deeply impressed suture, each one usually somewhat excavated above, the outer one conspicuously so below the carina; beneath rounded; covered with fine, radiating striæ, with occasionally a larger, rib-like one. Aperture sub-rhomboidal, the lip horizontal above, inflected externally, and rounded below in conformity to the calibre of the whorl. A single lamina revolves within, on the penultimate whorl.

Diameter one-fifth of an inch; length of axis one-thirtieth of an inch.

Inhabits Tahiti. *Couthouy*.

A most singular discoidal shell, resembling *Planorbis vortex*.

Figure 50, the shell above; 50 *a*, the shell below, and 50 *b*, laterally, enlarged; 50 *c*, natural size.

HELIX DÆDALEA (*Gould*).

Testa parva, discoidea, rubro-castanea, fusco tessellata, costellis radiantibus acutis confertis scabra, subtus acetabuliformis: spira anfractibus ad sex arcuè volutatis, duplo altioribus quàm latis, ad peripheriam rotundatis, infrà haud planulatis; suturâ impressâ: apertura angusta, verticalis, lunata; fauce lamellis nonis volventibus instructâ, quorum quatuor ad anfractum penultimum, uno ad columellam, duobus ad basim, tribus ad labium dispositis.

Helix dædalea, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 173. Sept. 1846. Expedition Shells, 21. PFEIFFER; Monog. Helic., i. 186.

SHELL small, discoidal, flat above, deeply concave beneath, rough, with crowded, sharp, radiating rib-striæ. Colour reddish-brown, checkered with dusky. Whorls about six, closely revolving, twice as high as wide, periphery rounded; suture well impressed. Beneath, all the whorls present their rounded edges so as to form a cup-shaped cavity. Aperture vertical, lunate, twice as high as wide, and extending one-third below the plane of the spire: fauces with nine revolving lamellæ, of which four are on the penultimate whorl, two at the base of the lip, and three within the outer lip; also the trace of another on the pillar.

Diameter one-tenth of an inch; axis one-twentieth of an inch.

Common under stones at Aurora or Metia Island; also at Tahiti.

In size and colour this resembles *H. contorta*, Fer., but the spire is more depressed, the whorls are more numerous and more compactly wound; there are twice as many lamellæ on the penultimate whorl, and the aperture is more contracted. From *H. bursatella* it differs in the aperture, the teeth, and in wanting a carina. The umbilicus is similar in form to that of the young *H. bursatella*, but the whorls, in forming it, maintain their rounded shape, instead of being flattened. It is smaller than the next species.

Figures 51, 51 *a*, 51 *b*, three views of the shell, enlarged; 51 *c*, natural size; 51 *d*, the aperture, magnified.

HELIX HYSTRIX (*Mighels*).

Testa parva, discoidea, latè umbilicata, tenuis, fusco et luteo tessellata: spira planulata, ad apicem indentata; anfractibus quinis, clathris creberrimis setigeris, aliquando denudatis, insignibus: apertura lunata, lamellis duobus conspicuis intro volventibus instructa.

Helix setigera, GOULD; Proceed. Boston Soc. Nat. Hist., i. 174. May, 1844.

Helix hystrix, MIGHELS, in sched.; PFEIFFER, Symb., iii. 67; Monog. Helic. Viv., i. 116; CHEMN., 2d edit., No. 560, tab. 89, f. 8–11.

SHELL small, planorboid, thin, checked above with radiating stripes of dusky and golden yellow, in about equal proportions, and becoming flexuous or zigzag as they pass to the under side. Spire flat, with the apex even depressed; whorls five, ornamented with numerous rib-striæ which radiate from the apex, and which, when fresh, are garnished with long crisped black hairs, that are easily rubbed off. Beneath, the whorls are more rounded than above, and there is a deep, broad umbilicus, about one-third the width of the base. Aperture lunate, lip simple, and within the throat two well-developed lamellæ usually revolve.

Diameter one-fifth of an inch ; axis one-tenth of an inch.

Obtained by Messrs. Brackenridge and Drayton, on East Maui, Sandwich Islands.

This shell agrees in form and coloration with *H. dædalea*, and *H. contorta*, Fer., but is larger than either, and further distinguished by the smaller number of lamellæ and the long, coarse hairs which it bears. As the name originally given by me was pre-occupied, I have adopted one suggested by Dr. Mighels, and published by Pfeiffer.

Some specimens found on the island of East Maui, by Messrs. Drayton and Brackenridge, differ somewhat from those originally examined. They are rather smaller, and the umbilicus and aperture is more contracted ; on the penultimate whorl of one specimen are two lamellar teeth, and on the lower half of the lip there are at least three short, indistinct laminæ.

Figures 52*, 52* *a*, 52* *b*, three views of the shell magnified ; 52* *c*, natural size.

HELIX STELLULA (*Gould*).

Testa parva, discoidea, supra planulata, subtus convexa, utroque umbilicata, fusca, interdum luteo-maculata : spiræ anfractibus quatuor triquetris, costibus acutis, frequentibus lyratis : apertura rhomboidea, lamellæ unicâ volvente instructa ; labro simplici.

Helix stellula, GOULD ; Proceed. Boston Soc. Nat. Hist., i. 174. May 1844.

SHELL small, discoidal, concave both above and beneath, of a dusky brown colour, here and there spotted with bright yellow. There are four or five whorls, flat above, convex beneath, and strongly carinated at the periphery, and also angular both above and below, so as to become triangular ; they are beautifully ornamented with prominent, compressed, rather distant radiating ribs, producing a stellate appearance at the margin. The suture is deeply impressed. Beneath, the umbilical cavity is about half the diameter of the shell, and exhibits

all the volutions. The aperture is somewhat rhomboidal, conforming to the angles of the whorl; lip consisting of one of the rib-like prominences; a single linear lamella revolves on the axial side of the aperture.

Diameter one-fifth of an inch; axis one-twelfth of an inch.

From the island of Maui, Sandwich Islands.

This is, perhaps, the most beautiful species of the group. It is distinguished by its angular whorls, and by its lamellar ridges, more prominent than in any other species, projecting at the periphery so as to cause it to resemble the rowel of a spur. Only three or four specimens were obtained.

Figures 52†, 52† *a*, 52† *b*, three views of the shell enlarged; 52† *c*, natural size.

HELIX CRESSIDA (Gould).

Testa variabilis, solida, depressa, lenticularis, acutè carinata, nitida, densè et acutè striata, fasciis flavo-viridibus et castaneis coalescentibus cincta, infrà sub-planulata, umbilico magno et profundo perforata: spira anfractibus quinque vix convexis: apertura triangularis; labro acuto; fauce lilacinâ.

Helix Cressida, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 176. Sept. 1846. Expedition Shells, 23. PFEIFFER; Monog. Helic., i. 123.

SHELL depressed, lenticular, very acute at periphery, about equally convex above and below, rather solid, shining, but obliquely striated with crowded, very delicate, and sharp lines of growth. General colour yellowish-green, varying to rusty, and generally banded above with darker chestnut, the colours blending at contact; sometimes there is also a band underneath. Whorls five, or somewhat more, scarcely convex or depressed at suture, so as to form a low dome. Umbilicus commencing rather suddenly, very broad, and penetrating to the summit. Aperture transverse, triangular; throat pale lilac.

Diameter seven-tenths of an inch ; axis one-fourth of an inch.

Inhabits the Society and Samoa Islands. *Couthouy*.

In many respects this is similar to *H. Troilus*, but it is more lenticular, and the whorls are less rounded. It is flatter beneath, and the colours are very differently disposed. The surface, though shining, is everywhere striated vertically, with sharp lines. In shape it is much like *H. acies*, Fer., but it is smaller and flatter underneath.

Figure 56, shell from above ; 56 *a*, 56 *b*, 56 *c*, three views of the green variety.

HELIX TROILUS (*Gould*).

Testa variabilis, depresso-conica, sub-discoidea, leviter et obtusè striata, flavescens, subtus convexa, in umbilicum amplum incurvata, carinata ; carinâ utroque lineâ spirali castaneâ marginatâ : interdum coloribus inversis : spira anfractibus quinque cum dimidio, rotundatis : apertura semilunaris, supernè angulata ; labro acuto.

Helix (*Carocolla*) *Troilus*, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 176. Sept. 1846. Expedition Shells, 23. PFEIFFER ; Monog., i. 123.

ANIMAL pale, pearly-violaceous anteriorly, yellowish-green posteriorly ; a dark line runs backward from each tentacle ; no distinct lateral furrow.

SHELL very variable, of a depressed, orbicular form, with sharp and conspicuous lines of growth, widely and deeply umbilicated, more or less sharply angular at periphery, colour reddish-brown, honey-yellow, or pale green, disposed in bands of greater or less width. Whorls five or six, moderately convex. Aperture transverse, lip simple, slightly expanding as it approaches the umbilicus ; throat tinged with pale violet.

The principal varieties are as follows :—

a. SHELL depressed, rounded, thick, of a deep brown colour, paler

at tip. Whorls rounded, periphery scarcely angular; beneath rounded. Aperture slightly transverse, rounded, or a little angular at the place of the keel. Umbilicus broad and deep, displaying all the whorls. Somewhat like *H. rufa*, Less.

Diameter eight-tenths of an inch; axis seven-twentieths of an inch.

Inhabits Upolu. *Couthouy*.

b. Of the same form, but of a honey-yellow colour, with a single very narrow brown band revolving upon the spire, and another beneath, near the keel.

Diameter three-fourths of an inch; axis three-tenths of an inch.

Inhabits Upolu. *Couthouy*.

c. More depressed, of a lenticular form, acute-angled at periphery, the whorls scarcely convex, each one having above a rusty brown band, and another of yellowish, about equal in width, somewhat blending with each other; beneath flattened, rusty-brown; aperture transverse, triangular; umbilicus large.

Diameter seven-tenths of an inch; axis one-fourth of an inch.

Found by Mr. Couthouy, at the roots of trees, in moist places;—Eimeo and Upolu. The animal has a dull fawn colour.

d. Somewhat more conical, with a more flattened base, thinner and more delicate, very acute at periphery, of a delicate pale green colour, having a single thread of brown revolving on the spire, and a broader one underneath; umbilicus broad; aperture acutely angular.

Diameter thirteen-twentieths of an inch; axis eleven-fortieths of an inch.

Inhabits Tongataboo.

It is like *H. planorboides*, Lesson (*H. solarium*, Quoy). It is, however, smaller, and more broadly umbilicated.

e. Low pyramidal, flat underneath, having a very acute, compressed keel at the periphery: the whorls are somewhat excavated, of a bright leaf-green colour, with a brownish band at each edge of the whorls above, and a whitish sutural line; umbilicus much smaller than in the other varieties; aperture very acutely triangular.

Diameter thirteen-twentieths of an inch; axis three-tenths of an inch.

Found by Mr. Couthouy, at Tutuila and Eimeo, on the wild Fehi. The animal is darker than that of variety *c*.

By comparison of numerous specimens, these shells, which differ so much in extreme varieties, have been reduced to one species. Varieties *a* and *d* are undoubtedly the same species, and pretty certainly variety *c*: but variety *d* may well be regarded as distinct, both on account of its characters and its habitat, and still more so may variety *e*. All of them, however, have the peculiar boxwood fabric, and all of them are uniformly banded at the apex.

Figure 55, the animal, with the shell of variety *e*; 55 *a*, top of the shell of the same variety; 55 *b*, top of the shell of variety *b*; 55 *c*, lateral view of the shell of variety *a*.

HELIX EURYDICE (*Gould*).

Testa tenuis, depresso-pyramidata, acutissimè carinata, pallidè virens, lineâ castaneâ volvente suprâ et infrâ picta, subtus planulata, umbilico lato et profundo perforata: spira anfractibus quinque ad sex vix convexis, apice rotundato: apertura transversa, acutè triangularis; labro acuto.

Helix Eurydice, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 177. Nov. 1846. Expedition Shells, 24. PFEIFFER; Monog. Helic., i. 119.

SHELL thin, depressed, pyramidal, very sharply carinate, very delicately striated, of a pale emerald green colour, having a single chestnut line revolving on the middle of the whorls above, and a broader one, near the margin, beneath. Whorls five or six, scarcely convex, or distinguished by the suture, forming a low conical spire, obtuse at the summit. Beneath rather paler, nearly flat, rounding off into a deep umbilicus. Aperture acutely triangular, transverse, coloured like the exterior.

Diameter thirteen-twentieths of an inch; axis eleven-fortieths of an inch.

Inhabits Tongataboo.

Approaches *H. Cressida*, but is much thinner, nearly transparent, of a much smoother texture at surface, more accurately pyramidal, more flat at base, and the colouring seems to be very uniform. The colour of the animal is also different. In shape it is almost precisely like *H. elegans*, though much larger. It is also like *H. planorboides*, Lesson (*H. solarium*, Quoy), which is very much smaller, and destitute of fillets. The shell figured by Philippi (Abbild. tab. 4, f. 9), as *H. marginata*, Müll., but which, from the umbilicus, and from a specimen in my collection, seems to be a variety of *H. trochiformis*, Fer., bears a very great resemblance to this species, except in its umbilicus.

Figure 57, the upper, 57 *a*, the lower, and 57 *b*, the lateral view of the shell.

HELIX TROCHIFORMIS (*Ferus.*) Pfeiffer.

“*Testa umbilicata, solida, trochiformis, apice obtusa, basi plana, acutè carinata, obliquè rugosa, saturatè rufa vel fusco-lutea; anfractibus sex, supra carinam prominentem stramineam convexis; umbilico angusto, pervio: apertura irregulariter rhombea; peristomate subreflexo, margine columellari rectè descendente, versus umbilicum expanso.*”
(Pfeiffer.)

Helicella trochiformis, FERUSSAC; Prodrömus, 301.

Helix trochiformis, PFEIFFER; Symbolæ, ii. 40; Monog. Helic. Viv., i. 206; PHILIPPI; Abbild. p. 79, tab. 4, f. 9.

ANIMAL covered with lines of elongated, subrectangular papillæ, the margin of the foot radiated. Colour pale leaf-green, violaceous on the back of the neck and halfway up the tentacles, the tips of which are chlorine green, as is also the mantle; marginal limbus rather bright green. Another specimen has a dark lateral line, with a bright olivaceous body and chlorine margin; and with a dark stripe down the tentacle and along the back of the neck. Sometimes the general colour of the body is purplish.

The shell is very much like *H. Eurydice*, but is uniformly distinguished from it by its smaller umbilicus, its larger, more elevated

form and darker grass-green colour, generally more or less banded with dark brown. The edge and sutural region are always pale. The surface is on the whole smooth, but the epidermis is sometimes so cracked as to appear irregularly radiated with whitish lines. The shell figured by Philippi (Abbild. tab. 4, f. 9) as *H. marginata*, Müll., I should regard as a variety of this species.

Found at Tutuila and Eimeo, Samoa Island. *Couthouy*.

Figure 58, shell with the animal ; 58 *a*, 58 *b*, two views of the shell.

HELIX TUMULUS (*Gould*).

Testa parva, solida, flavida, orbiculato-pyramidata, basi sub-planulata, umbilico modico perforata: spira elevata, conico-rotundata; anfractibus sex licet septem convexiusculis, striis perobliquis exaratis, ultimo obtusè ad peripheriam angulato, propè aperturam compresso: apertura parva, transversa, lunata; peristomate simplici.

Helix tumulus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 175. Sept. 1846. Expedition Shells, 22. PFEIFFER; Monog. Helic., i. 85.

SHELL small, solid, pyramidal, covered with a thin, honey-yellow epidermis, marked with numerous, rather irregular, very oblique lines of growth. Whorls nearly seven, slightly convex, forming an elevated summit rounded at the apex. The last whorl has its periphery obtusely keeled, and towards the aperture is somewhat compressed from above downwards. Aperture very oblique, broader than high, lunate, the peristome simple and sharp, the extremities joined by callus. Base horizontal, slightly convex, and perforated by a rather small, rounded umbilicus.

Length of axis two-fifths of an inch; diameter seven-twentieths of an inch.

Inhabits the Feejee Islands. *Drayton*.

This bears a general resemblance to *H. pyramidata* ; but with the same diameter, it is less elevated, and more rounded at apex.

Figures 53, 53 *a*, 53 *b*, three views of the shell.

HELIX TENTORIOLUM (*Gould*).

Testa parva, elevata, trochiformis, ad apicem rotundata, pallidè virescens, obliquè et concinnè striata, basi in umbilicum mediocrem devexâ : spira anfractibus sex planulatis, et carinâ acutissimâ, albâ, cinctis : apertura subtriangularis, basi rotundata ; labro simplici, ante umbilicum reflexo.

Helix tentoriolum, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 176. Sept. 1846. Expedition Shells, 23. PFEIFFER ; Monog. Helic., i. 119.

ANIMAL greenish, dark violaceous on the neck, with a dark line running back from each tentacle ; there is a bluish line along the flanks, and a yellowish-green margin with radiating marginal lineations. Surface finely reticulated.

SHELL small, delicate, trochoid, height and breadth about equal, apex obtusely rounded, delicately striated by the lines of growth, of a pale or sap-green colour. Whorls six, nearly plane, the periphery of each having a sharp, elevated, whitish carina, which overhangs the suture of the last three whorls, and very distinctly marks the limit of each one. The base is gently swelling, midway between the margin and umbilicus, which is of moderate size, with a regularly rounded entrance. Aperture sub-triangular, the basal portion rounded ; lip simple, columellar portion nearly vertical, and slightly reflected about the umbilicus.

Diameter two-fifths of an inch ; axis three-tenths of an inch.

Inhabits Upolu, Samoa Islands. *Couthouy*.

Its elevated form and rounded summit, resembling a nipple, is very remarkable.

Figure 54, the animal with the shell.

HELIX NITIDIUSCULA (*Sowerby*).

Testa angustè umbilicata, depresso-globosa, striata et punctulata, flavida, supernè lineis tribus rufis circumdata: spira anfractibus senis convexis; ultimo basi subinflato: apertura subcircularis; labro simplici; columellâ subdilatatâ, umbilicum haud occultante.

Helix nitidiuscula, SOWERBY; Zoolog. Journ., i. 57, pl. 3, f. 4. LOWE; Faun. Mader., 52, pl. 6, f. 6, &c.

ANIMAL with the body elongated, short, and pointed. Tentacles dark umber, with a dark line on the neck behind them; the superior ones very long and taper. Colour of the upper part of the body bright umber, fading into fawn-colour towards the foot, where it has a slight tinge of green; back of head and neck marked by four rows of interrupted black lines; no furrow on the neck. The whole body sub-diaphanous. [J. P. C.]

Obtained in Arum fields in the valley of the Courral, Madeira.

HELIX GULOSA (*Gould*).

Testa globulosa, crassa, rudis, sub-perforata, obsoletè carinata, pallidè castanea, colore saturiori nubilata, et interdum fasciata: spira anfractibus sex rotundatis, striâtis; ultimo amplissimo, et obsoletè costato-carinato; suturâ profundâ: apertura magna, rotundata, fauce lividâ; labro modicè reflexo, albido, propè columellam dilatato, umbilicum rimatum tegente.

Helix gulosa, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 165. Aug. 1846. Expedition Shells, 17.

ANIMAL throughout a deep sage-green, paler towards the edges; surface coarsely granulated. When in motion, instead of the usual gliding motion of the Helices, the mollusk of this shell flexes the foot

into about four vertical undulations, so as to touch the plane on which it moves at as many points; and these undulations pass from the tail towards the head as the animal moves, as in the motion of the caterpillar or millipede.

SHELL sub-globose, strong, coarse, obtusely keeled at the periphery, of a pale chestnut-brown, which is here and there diluted so as to form large, irregularly disposed clouds, and sometimes bands, the shades blending with each other; the region of the apex is generally pale, and that of the umbilicus dusky. Whorls six, well rounded, with coarse, irregular striæ of growth, the suture deeply impressed. The aperture is large, rounded, its diameters about equal; throat livid, becoming darker near the lip; peristome slightly reflexed, whitish, the basal portion nearly horizontal, and the extremities widely separated, columella rapidly widening, so as to leave a mere chink of the umbilicus uncovered; a very thin coating of enamel unites the two lips.

Diameter about one inch; axis four-fifths of an inch; diameter of the aperture three-fifths of an inch.

Found by Mr. Drayton, at Illawarra, New South Wales.

Remarkable for the great altitude of its outer whorl, and its large aperture. It is like *H. Californianus* in form, *H. albolabris* in texture, and *H. badia* in colour. It seems also to resemble *H. tumida*, Pfeiffer.

There can be no doubt that Mr. Drayton copied the animal precisely as he saw it; and whether it be its ordinary or only its exceptional mode of progression, it is certainly very extraordinary, and different from that of any other gasteropod; and the animal presents another of those grotesque forms, so many of which have already been found in New Holland.

In the original description of this animal in the Proceedings of the Boston Natural History Society, it was supposed that it inhabited a different shell, which was there named *H. pedestris*. An error has since been detected, and it is found that *H. gulosa* is the true shell, and *H. pedestris* is only a small specimen of *H. Townsendiana*. *H. ruida*, also, is probably an immature specimen of this latter species.

Figure 43, animal with the shell; 43 *a*, the aperture, and 43 *b*, the base of the shell.

HELIX NUTTALLIANA (*Lea*).

Testa sub-conica, subtus convexa, umbilicata, tenuiter striata; colore supernè luteo aut fusco, subtus castaneo; spira anfractibus septem, fasciâ nigrâ aut castaneâ cinctis: apertura subrotundata, depressa, intus fasciata; labro subreflexo; columella lævi.

Helix Nuttalliana, LEA; Trans. Am. Philos. Soc., vi. 88, pl. 23, f. 74. BINNEY; Boston Journ. Nat. Hist., iii. 369, pl. 12. United States Land Mollusks, ii. 159, pl. 18.

ANIMAL coarsely granular upon the neck, of a dull ochre colour, slaty posteriorly; on the sides the granules diminish, and are succeeded by coarse, undulating, interrupted ridges, radiating in every direction from the aperture, and terminating in a line nearly marginal; edge simple.

This species seems to be widely distributed, and quite common. It was found at most places visited by the Expedition, along the Columbia River, and at Puget Sound.

SHELL more variable in its colouring than any other one found in temperate America; the variations consisting in the presence or absence, the greater or less width and number of dark bands, while its form is well characterized and constant. It is pronounced by Dr. Pfeiffer to be *H. fidelis*, Gray; but as there are other species in that region corresponding equally well to Gray's indefinite description, I think it proper to retain Mr. Lea's name until the identity can be fully settled.

Figure 38, shell, with the animal.

HELIX TOWNSENDIANA (*Lea*).

Testa orbiculato-convexa, luteo-rufescens, rugosa, umbilicata; apertura subrotundata; labro albo, reflexo ad basim internè incrassato; columellâ lævi; basi tumido.

Helix Townsendiana, LEA; Amer. Philos. Trans., vi. 99. pl. 23, f. 80. BINNEY; Boston Journ. Nat. Hist., iii. 371, pl. 13. United States Land Mollusks, ii. 161, pl. 19. PFEIFFER; Monog. Helic. Viv., i. 341.

ANIMAL corpulent, gradually tapering. Colour pale yellowish-green; surface with rather sparse, feebly developed, elliptical granules, not seeming to have any definite arrangement; margin of the locomotive disk rather broad, granulated, but regularly marked with radiating furrows.

Brought from the Willamet district, Oregon.

Figure 36, shell, with the animal.

HELIX LABIOSA (*Gould*).

Testa depresso-conica, subtus convexa, arcuè umbilicata, luteo-cornea, pilis sericeis quincuncialiter dispositis undique villosa: spira anfractibus sex convexis, ultimo immodicè crescente et pone labrum valdè contracto: apertura angusta, lunata; labro albò, latè revolutò; fauce lividâ.

Helix labiosa, GOULD; Proceed. Bost. Soc. Nat. Hist., ii. 165. Aug. 1846. Expedition Shells, 16. BINNEY; United States Land Mollusks.

ANIMAL slender, tentacles much elongated. Colour pale ferruginous, with a lilac tint, darker on the neck. Whole surface even, the tentacles marked with coarse, elliptical granules, in longitudinal series; no marginal border.

SHELL depressed, about equally convex above and beneath, with a very small umbilicus partially covered by the lip; yellowish horn-colour. The epidermis is strong, and everywhere hispid with very fine, short, shining hairs, closely arranged in lozenge, so that the principal lines seem to run diagonally to the axis of the shell. When denuded of the hairs, the lines of growth are found to be scarred, at regular distances, with transverse elevations, on which the hairs were seated. Whorls six, the last one increasing very rapidly near the aperture, having nevertheless a deep constriction directly behind the lip. Aperture more than usually vertical, narrow lunate. Lip white,

widely reflected, flexuous in its course, not decidedly flattened. Throat pale violet or slightly livid.

Diameter over three-fifths of an inch; axis two-fifths of an inch.

Found in Oregon, at Astoria and Fort George, on the Columbia River, by Dr. Pickering and Mr. Drayton.

This is one of the shells from beyond the Rocky Mountains, corresponding in types found on the Atlantic slope. It is closely allied to *H. palliata*, but is smaller, more convex beneath, and lacks the columellar tooth. It is still somewhat doubtful if it is really distinct from *H. columbiana*, which may possibly have been described from small, denuded specimens, but I cannot, with a magnifier, discover on Mr. Lea's specimens the papillæ on which hairs might have been situated, and which are so readily seen in this species. The lip is also considerably broader, and peculiarly flexuous.

Figure 35, animal with the shell; 35 *a*, 35 *b*, two views of the shell; 35 *c*, portion of the shell magnified.

HELIX LORICATA (*Gould*).

Testa parva, depressa, flavo-viridis, arcuè umbilicata, squamulis undique loricata, subtus convexa: spira anfractibus quinque cum dimidio convexiusculis, arcuè volutatis, ultimo supernè ad peripheriam subangulato: apertura contracta, lunata, trilobata, dente laterali, dente basali, et dente columellari lamelliformi ringens; peristomate albo, reflexo, callo copioso conjuncto.

Helix loricata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 165. Aug. 1846. Expedition Shells, 17; BINNEY; Land Mollusks, ii. 145, pl. 29 *a*, f. 2.

SHELL small, depressed, spire less convex than the base, thin, of a yellowish-green colour, having the surface everywhere ornamented with small, crescentic scales of the epidermis, in relief, arranged along the lines of growth in quincunx. Whorls five and a half, slightly convex, separated by a deeply impressed suture, and forming a low conical spire; the periphery of the last whorl is angular near its poste-

rior portion. The base is rounded, tending rapidly to a deep umbilical depression, with a small perforation. Aperture small, crescentic, having a small, acute tooth on the right margin, a transversely oblong one at base, and a prominent, compressed, curved, nearly horizontal one on the columella, thus giving a three-lobed outline to the aperture. Peristome white, slightly reflected, having a very profound constriction of the whorl directly behind it.

Diameter one-fourth of an inch; axis three-twentieths of an inch.

Found near the Sacramento River, California. *Pickering*.

Its general form and its aperture are very much like *H. inflecta*, Say, though it is a much smaller shell, and the teeth of its aperture are much less developed. Its peculiar surface, resembling, when closely examined, a scaly coat of mail, is highly characteristic.

Figures 39, 39 *a*, two views of the shell, enlarged; 39 *b*, natural size; 39 *c*, sculpture, magnified.

HELIX DEVIA (*Gould*).

Testa orbiculato-depressa, obliquè striata, dilutè viridi-cornea, umbilico modico canaliculato perforata: spira anfractibus sex convexis, ultimo ad peripheriam rotundato: apertura transversa, obliquè lunata, ad anfractum penultimum unidentata, dente trigono; labro albo, latè reflexo, ad basim horizontali, umbilicum aliquanto ambiente.

Helix devia, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 165. Aug. 1846. Expedition Shells, 17.

SHELL solid, depressed globose, of a pale yellowish horn-colour, rather finely marked with the lines of growth. Whorls six, convex, separated by a well-defined suture, and forming a rounded spire. Beneath, slightly convex, and perforated by a moderate sized umbilicus, which appears to have an obtuse channel revolving on the whorls within it. Periphery rounded. Aperture transverse, obliquely lunate; lip white, rather broadly reflexed, horizontal at base, and abruptly turning up to form a short columella, where it dilates, and partly sur-

rounds the umbilicus. Near the upper angle, and on the penultimate whorl, is a white trigonal tooth.

Diameter four-fifths of an inch; axis nine-twentieths of an inch.

Obtained at Puget Sound, Oregon. *Drayton*.

This shell has the form of *H. Townsendiana*, but lacks the peculiar indentation of the surface. The lip is more broadly reflected, and the aperture is armed with a tooth. Placed side by side with the southern variety of *H. palliata*, somewhat blanched, it would hardly be distinguished except by its umbilicus.

Figures 74, 74 *a*, 74 *b*, three views of the shell.

HELIX GERMANA (*Gould*).

Testa parva, imperforata, globoso-lenticularis ad peripheriam subangulata, epidermide rufo-corneo, sparsim hirsuto induta; anfractibus quinque cum dimidio convexis; suturâ impressâ: apertura lunata, laminâ albâ, obliquâ, erectâ, munito; labro incumbente, reflexo, roseo.

Helix germana, GOULD; in BINNEY'S United States Land Mollusks, ii. 156, pl. 40 *a*, f. 2.

SHELL small, solid, imperforate, depressed, low-conical above, convex beneath, slightly angular at periphery, covered with a scabrous, rusty horn-coloured epidermis, beset with scattered hairs. Whorls five and a half, closely revolving, separated by a well-impressed suture; aperture lunate, the basal portion being but slightly curved, and turning upward at a rather sharp angle; lip incumbent, with a deep stricture behind it, moderately reflexed, roseate; on the intruding portion of the penultimate whorl is a distinct, oblong, erect, white tooth, not connected with either extremity of the lip.

Diameter three-tenths of an inch; axis one-fifth of an inch.

This shell was brought from the Pacific coast, and was marked Oregon.

At first sight this would not be distinguished from *H. monodon*. But, besides coming from a different zoological region, it has an imperforate, convex base, like *H. hirsuta*, instead of the pitted umbilical region which *H. monodon* has, whether perforated or not; and the hairs are much more sparsely distributed, being not more than one-fourth as numerous. The basal portion is less arcuated, so that the aperture is more transversely elongated, and less properly crescentic.

Figures 40, 40 *a*, 40 *b*, three views of the shell, enlarged; 40 *c*, natural size.

STREPTAXIS CONTUSA (*Ferussac*) *Gray*.

Helix contundata, FERUSSAC; Prodr. 30.

Helix contusa, FERUSSAC; Hist. des Moll., pl. 31, f. 1; pl. 39 *b*, f. 2-3.

Streptaxis contusa, GRAY; Loudon's Mag. N. S., i. 484.

ANIMAL. Body long and slender, rounded on the back; colour bright orange; organs of reproduction remote from each other, the male organ being close to the right inferior tentacle, and the female organ about midway between that and the respiratory cavity, on the same side; oral tentacles bifurcated at tip; locomotive disk narrower than the body. [J. P. C.]

The animal, as thus described by Mr. Couthouy, is the species above mentioned, as far as I have been able to determine. If so, it is interesting, as showing the animal of this genus, which has not yet been known; and that a genus which was founded on a peculiarity of the shell alone, namely, its distorted axis, is of real value. It approximates to *Vaginulus*, by the position of its genital organs, its narrow locomotive disk, and its forked oral tentacles.

Figure 70, shell, with the animal; 70 *a*, outline of the head, magnified.

BULIMUS MOROSUS (*Gould*).

Testa crassa, rudis, ovata, albido-cinerea, longitudinaliter striata, arcuè umbilicata; spira anfractibus quinque convexis; apertura subauriculata; peristomate latissimè revoluta, albo, posticè angulato; plicâ columellari amplâ.

Bulimus morosus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 190. Dec. 1846. Expedition Shells, 31. PFEIFFER; Monog. Helic. Viv., ii. 56.

SHELL of medium size, elongated ovate, somewhat angular in its contour, solid and coarse in structure, with coarse, irregular lines of growth, of a dingy white colour, and destitute of epidermis. Spire composed of five convex whorls, separated by a deep irregular suture. Aperture rather more than half the length of the shell, somewhat ovate-ear-shaped, the peristome very broadly revolute, white, somewhat angular posteriorly, and a little narrower at the base of the columella; the columellar fold largely developed. Umbilicus small.

Length of axis one and three-fourths inches; breadth one inch.

Inhabits the Feejee Islands.

It is of the same type as *B. malleatus* and *elobatus*, but is smaller, more solid, and less elegant than its associates. Its destitution of colours and epidermis, and its very broad lip, with its angular outlines, characterize it.

Figures 82, 82 *a*, two views of the shell.

BULIMUS ELOBATUS (*Gould*).

Testa solidula, elongato-ovata, longitudinaliter plicoso-striata et lineolis volventibus interruptis corrosa, epidermide sordidè luteo et viridi marmoratâ induta, arcuè umbilicata: spira anfractibus quinque convexis, ultimo magno: apertura angusta, sub-elliptica; labro simplici, obtuso, aurantiaco; plicâ columellari perobliquâ.

Bulimus elobatus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 190. Dec. 1846. Expedition Shells, 31. PFEIFFER; Monog. Helic. Viv., ii. 184.

SHELL rather solid, elongated ovate, the surface rough and undulated by the striæ of growth, somewhat etched with minute, crowded, interrupted revolving lines. Whorls five, or a little more, rather ventricose, the last one ample, and covered with a coarse, loosely adhering, dingy yellow epidermis, marbled with deep green blotches, arranged somewhat in longitudinal zigzag stripes. Aperture narrow, and rather small, half as long as the shell, nearly elliptical, pale orange within, becoming intense at the columella and lip, which is obtuse, but not reflected. The columella has a moderate-sized, very oblique fold. Umbilicus distinct, oblong, of moderate dimensions.

Length of axis two and a quarter inches; breadth one and two-fifths of an inch.

Inhabits the Feejee Islands.

Belongs to the same group as *B. fulguratus* and *B. malleatus*, Jay, characterized by the large fold on the columella. It is the largest of the three, resembling the former in its sculpture and the colouring of the aperture, and the latter in general colouring. It is distinguished by its unreflected lip, its narrow aperture, less conspicuous and more oblique columellar fold, more ventricose and less oblique whorls.

Figures 84, 84 *a*, two views of the shell.

BULIMUS PRUNINUS (*Gould*).

Testa ovato-turrita, solida, leviter striata, livido-purpurea, infra suturam et circa umbilicum albido-zonata; spira acuta, anfractibus sex convexiusculis, sub-tabulatis: apertura modica, ovata; labro simplici, intus callo stramineo incrassato, ad columellam reflexo; fauce livido.

Bulimus pruninus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 191. Dec. 1846. Expedition Shells, 32. PFEIFFER; Monog. Helic. Viv., ii. 122.

SHELL turreted, ovate, acute at apex, opaque, solid, irregularly striated with the incremental lines, of a livid purplish, or plum-colour, with an ash-coloured zone about the umbilicus, a band contiguous to the suture, and occasionally the lines of growth of the same colour. Whorls six, slightly convex, and somewhat shouldered above, the last one nearly two-thirds the length of the shell. Aperture ovate, rather small, lip simple, thickened, and yellowish-white within; columella with a moderate fold, rapidly widening upwards, and covering a small umbilicus; throat livid purplish.

Length of axis seven-eighths of an inch; diameter three-eighths of an inch.

It probably came from the Madeira Islands.

This species belongs to the same group as *B. badiosa*, Ferus., and *B. bæticata*, Reeve, species which differ from it in being curiously granulated.

Figures 83, 83 *a*, two views of the shell.

BULIMUS PROLATUS (*Gould*).

Testa ovoidea, antrorsum angustata, leviter striata, albido-cinerea, fasciis quatuor liturarum ferruginearum cincta: spira ovato-conica; anfractibus quinque convexiusculis: apertura elliptica, totius longitudinis dimidium adequans; labro simplici, acuto: columella brevis, latè reflexa, alba, umbilicum parvum tegens.

Bulimus prolatus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 191. Dec. 1846. Expedition Shells, 32. PFEIFFER; Monog. Helic. Viv., ii. 171.

SHELL an elongated, prolate spheroid, nearly as much attenuated at base as at spire, surface nearly smooth and regular, of a grayish or ash-colour, with about four revolving bands of partially connected blotches on the large whorl, and three on the smaller ones. Whorls five, slightly convex, and very little rounded at the sutures. Aperture about half the length of the shell, of an elliptic form, a little angular

posteriorly; lip simple, the columella rather broadly reflexed, short, white, and protecting a small umbilical perforation.

Length of axis one and three-fourths of an inch; breadth one inch.

Found by Mr. Couthouy, near Santiago, Chili.

A shell remarkable for its regular, elongated, ovoid form, and its four bands of rusty-brown blotches. It is somewhat like *B. Favannii*, only more narrowed anteriorly.

Figures 79, 79 *a*, two views of the shell.

BULIMUS CILIATUS (Gould).

Testa tenuis, ovato-conica, viridis, striis volventibus ciliis rigidas nunc longas nunc breviores gerentibus, cincta: spira acuta, anfractibus sex convexis, ultimo magno, ventricoso, sub-angulato: apertura sub-ovata, anticè angustata; labro simplici; columellâ rectâ, albâ, umbilicum parvum obtegente.

Bulimus ciliatus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 191. Dec. 1846. Expedition Shells, 32. PFEIFFER; Monog. Helic. Viv., ii. 74.

ANIMAL very dark slate-colour, almost black, oculiferous tentacles long and slender, and, like the neck, finely granulate; body obliquely wrinkled; foot and mouth paler; respiratory orifice very large.

SHELL thin and fragile, ovate-conic, acute at summit, covered with minute, crowded, longitudinal and revolving striæ. On the revolving striæ are seated series of dark, stiff, tapering, slightly recurved hairs, of unequal length; there are about eight series of the long ones on the penult whorl, and about twenty on the last whorl, between two of which are either two or three series of shorter and finer ones, the whole resembling coarse velvet. Whorls six, convex, the last one large, ventricose, and subcarinate. Suture profound. Aperture sub-ovate, slightly angular at base; lip simple, acute; columella straight, white, reflected over a small, deep perforation. [J. P. C.]

Length of axis five-sixths of an inch ; breadth six-tenths of an inch.

Found by Dr. Pickering, on the Organ Mountains, Brazil, crawling on bushes, near the water.

This shell, with its thick green epidermis, looks like a *Paludina*, especially like fresh specimens of *P. decisa*, Say, which have similar series of ciliæ. Another Brazilian species (*B. velutino-hispidus*, Moric.), has a similar velvety vesture, but it is a more globular, heliciform species.

Figure 80, front view of the shell ; 80 *a*, side view of the shell, with the animal.

BULIMUS JUNCEUS (*Gould*).

Testa parva, elongato-conica, tenuis, translucida, dilutè virens, concinnè striata, vix perforata : spira ad apicem obtusa ; anfractibus septem convexiusculis, supernè contabulatis : apertura elongato-ovata ; labro simplici, ad columellam vix reflexo.

Bulimus junceus, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 191. Dec. 1846. Expedition Shells, 32. PFEIFFER ; Monog. Helic. Viv., ii. 220.

SHELL small, thin, translucent, elongated, turreted, of a pale green colour, obtuse at apex, covered with delicate longitudinal striæ. Whorls seven, slightly convex, presenting a broad shoulder above. Aperture long ovate : lip simple, on the left slightly reflected over a minute umbilical chink : the last whorl about one-third the length of the whole shell.

Length of axis three-tenths of an inch ; breadth one-tenth of an inch.

Inhabits Tahiti and Eimeo.

This shell very closely resembles a West India species, and is, per-

haps, the same, and may be a denizen of the cocoa-nut or banana, wherever found. *B. bacterionides* agrees in form, but this is *not* "smoother than *octona*," and has not nine whorls.

Figure 87, front view of the shell, enlarged; 87 *a*, a variety of the same, enlarged; 87 *b*, natural size.

BULIMUS EGREGIUS (*Pfeiffer*).

Testa crassa, elongato-ovata, polita, castanea, lituris ochraceis admodum obliquè ordinatis maculata: spira anfractibus sex convexis, sub lente spiraliter striatis; ultimo magno sub-compresso, ad basim obliquè carinato et rimâ umbilicali perforato: apertura angustata, elongato-elliptica, anticè angulata et canaliculata; labro crasso, latè reflexo, rubro-purpureo; fauce roseo.

Bulimus egregius, PFEIFFER; Proceed. Zool. Soc., July 1845, 67; Monog. Helic. Viv., ii. 50. REEVE; Conch. Icon., pl. 34, f. 205.

Bulimus hybridus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 191. Dec. 1846. Expedition Shells, 32.

SHELL rather solid, elongated-ovate, turreted, smooth, polished, somewhat indented, the lines of growth scarcely apparent, encircled by very fine, rather distant parallel lines. Colour dark chestnut, with nearly an equal proportion of gamboge-coloured blotches, which are arranged in somewhat oblique series, sometimes even in stripes; ro-seate towards the apex. Whorls six, rather convex, separated by a well-marked, margined suture, the last one large, and slightly compressed from before backwards, and having an obtuse keel near the base, and a channel running to the umbilicus between it and the lip. Aperture long, narrow rhomboidal, and somewhat channeled at base; lip broadly reflected, of a rich reddish-purple, nearly continuous posteriorly; throat rosy purple.

Length of axis one and three-fourths of an inch; diameter five-eighths of an inch.

Obtained at Rio Janeiro.

Compared with *B. goniostoma*, it is less elongated, more solid, smooth, and polished, without wrinkles or rows of granules. The whorls are more convex. The aperture has a more vivid colour. The lip is more widely reflected. The ground colour is darker, and mingled in about equal proportions with oblique blotches of ochre yellow. There are distant microscopic revolving lines, with now and then one of them crenulated. It has the size, form, and marking of *B. multicolor*, with the aperture of *B. goniostoma*.

It appears that this shell was described previous to the publication of my description; but as this fact was not ascertained till after the figure was engraved, I have retained it.

Figures 86, 86 *a*, two views of the shell.

BULIMUS AURIS LEPORIS (BRUG.), Encyc. Meth. i. 346. *Bulimus lagotis*, MENKE; Synop. 2d ed. 26. *Auricula leporis*, LAM.; 2d ed. viii. 325. *Helix auris leporis*, FERUS.; Prodr. 438. *Pupa auris leporis*, GRAY; Ann. of Philos., N. S. ix. 412. *Stenostoma auritura*, SPIX; Test. Brasil. 18, tab. 13, f. 1, 2. *Otostomus lagotis*, BECK; Index, 55.

ANIMAL elongated, lanceolate, somewhat dilated at the posterior third, and tapering thence to an acute point. Tentacles all long and slender. Colour slaty-brown, darker on the centre and sides of the neck: tentacles minutely granular, pale ferruginous. Surface very minutely reticulated, with a very delicate, submarginal furrow.

Found on orange and myrtle trees abundantly, near Rio Janeiro.

Figure 75, side view of the animal, with the shell.

BULIMUS PROTEUS (BRODERIP), Proceed. Zool. Soc., 1832, 107. *Bulimus sordidus*, LAM.; An. sans Vert. viii. 267; (nec Lesson) *Buliminus proteus*, BECK; Index, 69.

ANIMAL broad lanceolate, of a slaty-drab colour; surface with longi-

tudinal ranges of elongated papillæ on the neck; sides delicately reticulated, with distant, fine, oblique channels, and a submarginal, shallow sulcus. Tentacles of moderate proportions. Colour slaty-drab.

Found at the Campaña de Quillota, Chili. *Couthouy*.

Figure 76, the animal, with a variety of the shell; 76 *a*, facial view of the head of the animal.

BULIMUS CHILENSIS (LESSON), LAM.; ed. Desh. viii. 264 (not Sowerby and Beck). *Achatina Chilensis*, LESSON; Voy. de la Coquille, 317, pl. 7, f. 3. *Bulimus granulosus*, BROD.; in Proc. Zool. Soc. 1832, 31. *Bulimus granulosus*, POTIER et MICH., Galerie, i. 142, pl. 13, f. 9, 10. *Bulimulus graniger*, BECK; Index, 67.

ANIMAL slender and rather delicate, tapering to a fine point posteriorly, pale flesh-colour, superior face of the neck coarsely tessellated with quadrate papillæ; sides coarsely reticulated, without a distinct submarginal furrow. Tentacles rather small, with large eye-bulbs. An oval area is marked upon the front.

Found in the interior of Chili. *Couthouy*.

Figure 81, side view of the animal, with the shell; 81 *a*, 81 *b*, views of the head in front and beneath.

BULIMUS SHONGH (LESSON); Voyage de la Coquille, 321, pl. 7, f. 4, 5. KÜSTER; tab. 16, f. 14, 15. PFEIFFER; Monog. Helic. Viv., ii. 140.

ANIMAL uniform blue-black, corpulent, about the length of the shell, dilated into undulating wing-like expansions at the side, so as to become nearly as broad as long. Posteriorly it is broadly rounded, and does not attain, when in motion, to more than two-thirds the length of the spire. The head is large and obtuse; the tentacles short and slender, pale yellowish at tip; on the top of the neck the

surface is diversified with rows of longitudinal granules; the lateral portions are rather coarsely reticulated. The locomotive disk is paler. The genital orifice, behind the right tentacle, is a large slit, with a furrow running from it obliquely forward and downwards, much as in *Aplysia*.

Found at the Bay of Islands, New Zealand. *Drayton*.

From the preceding description it is plain that this species is separated from the other *Bulimi* by many important characters. The lateral expansion of the foot, like a broad flounce, its broadly rounded termination, its disproportionately short and small tentacles, all unite to separate it as a distinct subgenus, approximating to the true *Auricula*. Some such striking deviation from the ordinary type we might naturally expect in an isolated region so remote.

Figure 85, the animal with the shell, seen from above; 85 *a*, lateral view of the animal with the shell; 85 *b*, front view of the head of the animal.

BULIMUS FULGURATUS (JAY); *Revue Zool.* 1842, p. 80. Guerin's *Mag. de Zool.* 1843, pl. 62. PHILIPPI; *Abbildungen*, ii. 9, pl. 3, f. 2. PFEIFFER; *Monog. Helic. Viv.*, ii. 55.

ANIMAL cream-coloured, depressed, rather slender, much thinned at the edges; posteriorly flattened, and terminating obtusely. Surface with longitudinal, slender, lozenge-shaped reticulations; marginal limbus rather broad, marked with rather distant oblique lineations.

Inhabits the Feejee Islands.

Mr. Reeve seems to regard his *B. eximius*, a South American shell, as identical with this, though I apprehend that they are really quite different.

BULIMUS MALLEATUS (JAY); *Revue Zool.* 1842, 40. GUERIN; *Mag. de Zool.*, 1843, pl. 61. PHILIPPI; *Abbild.*, ii. 9, pl. 3, f. 4. PFEIFFER; *Monog. Helic. Viv.*, ii. 55.

ANIMAL corpulent, head and neck thick and clumsy, body posteriorly flattened, and broadly rounded. Surface somewhat ocellate, with ranges of white granular papillæ, uniformly distributed. Dark fawn-coloured.

Inhabits the Feejee Islands.

The peculiar flattened and rounded posterior termination of the body, in the two last species, instead of the usual attenuated form, is quite remarkable; and as they are locally related, so they seem to be naturally allied to each other also.

Figure 78, animal with the shell.

PARTULA CONICA (Gould).

Testa elongato-conica, interdum sinistrorsa, flavida vel castanea, leviter striata et lineis crebris volventibus decussata, latè perforata: spira elevata, acuta, anfractibus sex ventricosis, ultimo permagno; suturâ impressâ, albidâ: apertura obliqua, ovalis; peristomate albo vel roseo, latè reflexo, sub-planulato.

Partula conica, GOULD; *Proceed. Boston Soc. Nat. Hist.*, ii. 196. March 1847. *Expedition Shells*, 33.

ANIMAL. Lance-pointed behind, depressed, cream-coloured, reticulated with slate blue, and somewhat dotted along the back of the neck, at the base of the tentacles; "nearly colourless, and remarkable for the unusual length of the buccal tentacles," &c.

SHELL often reversed, large, but not particularly solid, elongated, acutely conical, the lines of growth very delicate, and crossed by very fine and numerous revolving, generally undulating lines. Colour varying from pale citron-yellow to dark chestnut. Whorls six, very

oblique and well rounded, the last one large, inflated, but somewhat angular at base; a little shouldered: suture well marked and whitish. Aperture obliquely elliptical, modified posteriorly by the penultimate whorl; peristome broadly reflected, retreating as it passes before the umbilicus, not fully flattened, white, or tinged with rose-reddish, especially in the dark-coloured specimens. Umbilicus large, and nearly circular.

Length more than an inch; breadth half the length.

Found at Upolu and Tutuila, Samoa Islands, at an elevation of from 200 to 1500 feet, on plantains, and on *Dracæna terminalis*. *Couthouy*; *Drayton*.

This is larger than any species hitherto described, and resembles *Bulimus lævus* in form. It may possibly be the same as *P. bulimoides*, Lesson.

Figure 88, brown variety, with the animal; 88 *a*, front view of the yellow variety.

PARTULA ZEBRINA (*Gould*).

Testa variabilis, ovata, tenuis, alba, flava vel fulva, plerumque strigis longitudinalibus flexuosis albis variegata, spiraliter tenuistriata, umbilico rimato perforata: spira anfractibus ad quinque rotundatis, ultimo ventricoso: apertura elliptica, peristomate albo, latè reflexo, planulato; plicâ columellari magnâ.

Partula zebrina, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 196. March 1847. Expedition Shells, 33.

ANIMAL elongated, pointed behind, rather depressed, tentacles long, pale cream-colour, reticulated on the neck with ranges of oblong meshes, on the sides with radiating ones, tips of tentacles bluish, no marginal furrow.

SHELL ovate, short, ventricose, thin, in colouring variable, being

sometimes pure dead white, in other specimens yellowish flecked with white, in others more or less fawn-coloured, striped longitudinally with irregular zigzag lines, which are sometimes anastomosing; striæ of growth delicate, with crowded, very fine revolving lines. Spire acute, of nearly five rounded whorls, the last of which composes three-fourths the length of the shell, and is much reflected. Suture margined. Aperture oval, modified by the last whorl. Peristome broad, thin, white, flattened, and inwardly strengthened so as to bound the aperture with a sharp right angle, and to contract the orifice. At the columellar margin is a pretty large fold, which answers to an umbilical fissure.

Length four-fifths of an inch; breadth half an inch.

Inhabits Upolu and Tutuila, Samoa Islands, on *Dracæna borealis*.
Couthouy; Drayton; Case.

A rather large and very fine species, more ventricose than others, and distinguished by its perfectly flattened peristome as well as by its variegated colouring and revolving striæ. It somewhat resembles *Bulimus versicolor*.

Figure 89, a dark shell, with the animal; 89 *a*, the pale variety.

PARTULA PUSILLA (*Gould*).

Testa parva, elongata, conica, polita, albido-cornea, perforata: spira acuta, anfractibus sex convexis, supernè tabulatis: apertura subquadrata, posticè lamellâ intro-volvente instructa; peristomate reflexo, dextrorsum sinuato.

Partula pusilla, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 197.
Expedition Shells, 33.

SHELL minute, elongated, conical, rather thick, smooth and shining, of a light horn-colour, moderately umbilicated. Spire acute, composed of six moderately convex whorls, which have a small shoulder posteriorly. The aperture is direct, somewhat quadrangular, having

a single lamina on the last whorl revolving within the shell; peristome moderately reflexed, the outer lip inclining somewhat inwards.

Length one-eighth of an inch; breadth one-fourth of an inch.

Found at Metia Island, under stones. *Couthouy*.

This little species bears all the characters of the group, and is by far the most minute species yet described.

Figure 90, the shell enlarged; 90 *a*, natural size.

PARTULA TAHEITANA, BRUG.; Encyc. Meth., i. 347. DESH.; in Lam. An. sans Vert., viii. 281. LESSON; Voy. de la Coq., pl. 7, figs. 6, 7. *Partula auriculata*, BROD.; Proc. Zool. Soc., 1832. REEVE; Conch. Syst., pl. 175, f. 7, 8. *Bulimus auriculatus*, PFEIFFER; Symb. i. 80, ii. 111.

ANIMAL yellowish, tentacles and line along the back of neck dusky; surface finely reticulated.

The genus *Partula* seems to be peculiar to the islands in the Pacific Ocean, such as the Society, Friendly, and Navigator's Islands. A single living specimen of this species, however, was found near Honolulu, in the valley of Nuuanu. As this is the only one in the collection of the Expedition, and the only one I have any knowledge of, from that island, I think it must be regarded as a straggler, accidentally introduced. We should, however, except *P. Owaihiensis*, which abounds at the Sandwich Islands, but which, from its peculiarities, has been placed in the new genus *Tornatellina*. The animal of *Partula* presents no external characters to distinguish it from *Bulimus*; but its internal organization and natural habits would, we think, indicate distinct characters, as the isolation of the group would lead us to anticipate.

Figure 91, shell, with the animal.

PARTULA VARIA, BROD.; Proc. Zool. Soc., 1832, p. 125. *Bulimus varius*, PFEIFFER; Symb. i. 86, ii. 124.

ANIMAL like that of *P. Taheitana*, varying only in the depth of colouring.

Figure 92, shell, with the animal.

PARTULA VANIKORENSIS, Quoy and Gaim. (*Helix*); Astrol., ii. 215, pl. 9, f. 12-17.

Bulimus Vanikorensis, DESH.; in Lam., An. sans Vert., viii. 131.

ANIMAL not essentially different from the two preceding, excepting that it is somewhat paler.

Figure 93, shell, with the animal.

ACHATINELLA MARMORATA (*Gould*).

Testa oblongo-ovata, coloribus castaneis, cinereis et albidis marmorata, leviter striata, imperforata: spira acuta, anfractibus sex convexis, supernè sub-tabulatis, ultimo magno, ventricoso; apertura ovata; peristomate simplici, modicè evaso; plicâ columellari albâ, compressâ, ferè transversâ, valdè exstante.

Achatinella marmorata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 200. March 1847. Expedition Shells, 35.

SHELL dextral, rather solid, of an elongated, acutely conical form, composed of six convex whorls, which are somewhat shouldered superiorly; the last large in proportion, and ventricose: surface delicately striated with lines of growth; colour a dusky chestnut, marbled with white, irregular, and angular markings, generally arranged somewhat in longitudinal stripes, the whole seeming to be coated with a very thin ash-coloured epidermis. Aperture moderately large, ovate,

the lip slightly expanded: the columellar fold white, compressed, nearly transverse, and standing out very prominently.

Length seven-eighths of an inch; breadth half an inch.

Found on the island of Maui, Sandwich Islands, at the foot of Mount Haleakala. *Drayton; Brackenridge.*

A large, ventricose species, readily distinguished by its variegated colouring.

Figures 94, 94 *a*, two views of the shell.

ACHATINELLA NUBILOSA (Gould).

Testa solidula, ovato-conica, ventricosa, cinereo-lutescens, fusco-viridis angulatim flammulata et reticulata, ad apicem castanea: spira anfractibus septem convexis: apertura lunata, eburnea; labro acuto, dilatato; plicâ columellari acutâ, lamelliformi.

SHELL rather solid, ovate-conic, ventricose, delicately striated, covered with a thin epidermis of a diluted golden-yellow colour, variegated with dusky green, forming a network by its zigzag markings on the middle whorls, and becoming predominant towards the base; the apical whorls chestnut-brown. Whorls about seven, well rounded, the last one about three-fifths the length of the shell. Aperture rounded lunate, ivory-white, the lip sharp and a little everted; columellar fold prominent, sharp, lamelliform.

Length seven-eighths of an inch; breadth not quite half an inch.

Inhabits the island of Maui, Sandwich Islands.

This species belongs to the same group as *A. ventulus*, but is well distinguished by its peculiar coloration.

Figure 95, view of the shell.

ACHATINELLA ELLIPSOIDEA (*Gould*).

Testa solida, ellipsoidea, lævis, epidermide luteo interdum fusco zonato induta: spira anfractibus sex convexiusculis; suturâ impressâ: apertura parva, angusta; peristomate acuto, nigro; plicâ columellari ferè transversâ, tenui.

Achatinella ellipsoidea, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 200. March 1847. Expedition Shells, 35.

SHELL solid, ellipsoidal, smooth, covered with a thin ochreous and fawn-coloured epidermis, the colours arranged somewhat in zones. Spire ovate-conical; whorls six, slightly convex, not shouldered; suture well marked. Aperture very small and narrow, lip simple, not thickened, edged black; columellar fold delicate, oblique, nearly transverse, without callus.

Length of axis seven-twentieths of an inch; breadth seven-tenths of an inch.

Inhabits Maui, Sandwich Islands. *Brackenridge; Hale.*

Closely allied to *A. ventulus*, FER., but is more slender, more smooth, tapering anteriorly, the last whorl sometimes closing towards the axis as it approaches the aperture, so as to appear distorted, and produce a very small aperture. *A. tristis* has a similar epidermis, and a small, sharp-lipped aperture, but is much more ventricose, and has the whorls shouldered. *H. microstoma* has a thickened lip, and a more dead, striated surface.

Figures 96, 96 *a*, two views of the shell.

ACHATINELLA ACUMINATA (*Gould*).

Testa parva, elongata, turrita, lucida, glaberrima, nitida, succinea: spira elevata, anfractibus sex obliquis, convexiusculis, ultimo trientes duos longitudinis equante: apertura angusta, sub-elliptica, peristomate

albido, incrassato, prorsum arcuato; columellâ truncatâ, sed vix plicatâ.

Achatinella acuminata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 200. March 1847. Expedition Shells, 35.

SHELL small, slender, turreted, elongated, with an obtuse apex, translucent, thin, very smooth and shining, of a greenish amber-colour. Spire elevated, obtuse, pointed, of six very oblique, slightly convex whorls, the last of which is nearly two-thirds the length of the shell. Suture distinct, and faintly margined and crenulated. Aperture very narrow, one-third the length of the shell, rounded at base, and acute behind. Lip simple, whitish, thickened within, and arching forward. Columella without a conspicuous fold bordering the truncation.

Length half an inch; breadth one-eighth of an inch.

Inhabits Kauai, Sandwich Islands.

More elongated, and with more oblique whorls than other species. In its form, colour, and transparency, it may be compared with *Physa hypnorum*.

Figure 100, the shell enlarged; 100 *a*, natural size.

There are several species of shells peculiar to the Sandwich Islands which have the same elongated form and delicate structure, with a polished surface, and the mere semblance of a columellar fold. I propose to designate this group by the name of LEPTACHATINA (λεπτος, and ACHATINA). It is intermediate between true *Achatina* and *Achatinella*. The three following species also belong to this group.

ACHATINELLA ACCINCTA (*Mighels*) Gould.

Testa ovato-conica, solidula, obliquè striata, sordidè cornea: spira conica, obtusiuscula; anfractibus sex cum dimidio planulatis, ultimo trientem longitudinis vix superante; suturâ marginatâ: apertura semiovalis; labro simplici, obtuso; columellâ arcuatâ, plicato-tortâ.

Achatina accineta (lapsu typog.), MIGHELS; Proceed. Boston Soc. Nat. Hist., ii. 20. Jan. 1845.

Achatina accincta, PFEIFFER; Monog. Helic. Viv., ii. 271.

Achatina Sandwicensis, PFEIFFER; Proc. Zool. Soc., 1846, p. 32.

ANIMAL of a slate colour tinted greenish, darker behind the tentacles.

Inhabits Oahu, Sandwich Islands.

The specimens collected by the Expedition are generally more solid, opaque, and darker than those possessed by Dr. Mighels. They are oftentimes decidedly plicate longitudinally, and sometimes have revolving scratches. Some are banded in various ways with ivory-white, and have the lip more or less thickened and everted. The aperture is rather large, and the fold is sharp, placed at an angle of about 45°.

Figure 97, the shell; 97 a, shell, with the animal.

ACHATINELLA GUTTULA (*Gould*).

Testa parva, tenuis, lucida, rotundato-ovata, succinea, interdum castaneo zonata: spira obtusa, anfractibus sex convexiusculis, ultimo tumido, dimidiam longitudinis superante: apertura parva, lunata; peristomate albo, incrassato, ad basim valdè truncato; columellâ curtâ, plicâ parvâ instructâ, ad anfractum penultimum callo indutâ.

Achatinella guttula, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 201. Expedition Shells, 35.

SHELL small, thin, translucent, shining, short ovate, yellowish-green, slightly striated lengthwise, with sometimes a faint appearance of revolving rufous bands. Whorls six, short, slightly convex, the last tumid, more than half the length of the shell, forming an obtuse spire. Aperture small, lunate, lip thickened, whitish; basal notch large; columella very short, the fold small but distinct, and the penultimate whorl coated with callus.

Length one-eighth of an inch ; breadth three-sixteenths of an inch.

Inhabits Maui, Sandwich Islands.

One of the smallest and the shortest proportioned species belonging to this group, its length being but little greater than its breadth. It is much more ventricose and less solid than *A. accincta*.

Figure 98, the shell, enlarged ; 98 *a*, natural size.

ACHATINELLA CEREALIS (*Gould*).

Testa parva, elongata, cylindraceo-conica, impolita, cinereo-castanea : spira obtusa, anfractibus septem ad octo planulatis, ultimo trientem longitudinis vix superante : apertura parva, lunata, quadrantem longitudinis adequans ; peristomate simplici, intus incrassato ; plicâ columellari obsoletâ ; anfractu penultimo callo induto.

Achatinella cerealis, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 201. Expedition Shells, 36.

SHELL small, conic cylindrical, elongated, rather solid, opaque, covered with an unpolished ashy-brown epidermis. Spire composed of about eight nearly flat whorls, obtuse at tip, separated by a well-marked suture ; the last whorl but little more than one-third of the length of the shell. Aperture small, semilunar, about one-fourth the length of the shell. Lip simple, whitish, thickened within ; entire and rounded at base. Columella with a very faint notch and fold : penultimate whorl coated with enamel.

Length of axis three-eighths of an inch ; breadth one-eighth of an inch.

Found at Waianai, island of Oahu, Sandwich Islands. *Case*.

In size, form, and colour it resembles *Bulimus hordeaceus*, but it is still more slender.

Figure 99 the shell enlarged ; 99 *a*, natural size.

BALEA PEREGRINA (*Gould*).

Testa parva, sinistrorsa, elongata, sub-fusiformis, solida, opaca, rufo-cinerea, vix striata, perforata: spira ad apicem mammillata; anfractibus octo, planulatis, sub-tabulatis; suturâ lineari, profundâ: apertura sub-quadrata; peristomate continuo, æquato, leviter reflexo.

Balea peregrina, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 197. March, 1847. Expedition Shells, 34.

SHELL reversed, small, solid, elongated, somewhat fusiform, blunt at the tip, with a few irregular, longitudinal striæ, seldom entirely crossing a whorl, and of a dead ashy-brown colour. There are eight whorls, of which the two preceding the last are the largest and flat, while those near the apex are rounded: they are all a little shouldered and separated by a linear, deeply-impressed suture. The aperture is longitudinal, somewhat four-sided, with rounded angles; the peristome is continuous, rising up to a level with the surface of the shell, and a very little reflexed. The columellar side is highly raised in front of a well-developed umbilicus.

Length three-eighths of an inch; breadth one-tenth of an inch.

Inhabits New Zealand.

I have referred this shell to the genus *Balea* with much hesitation, on account of its locality. It is remarkable for its fusiform, turreted shape, and for the high walls of its aperture, which rise to a level with the surface of the shell.

Figure 105, the shell enlarged; 105 *a*, profile of the aperture enlarged; 105 *b*, natural size.

MEGASPIRA ELATA (*Gould*).

Testa sub-cylindracea, elevata, tenuis, nitida, striis conspicuis lirata, cornea, lituris parvis sparsis propè suturam notata, vix perforata: spira obtusa, anfractibus novemdecim angustis sub-planulatis: aper-

tura parva, obliqua, lunata, anticè subeffusa, posticè lamellam volventem gerens; plicâ columellari modicâ, bilamellatâ.

Pupa (Megaspira) elata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 197. March 1847. Expedition Shells, 34. *Bulimus (Pupa) elatior*, var. γ , PFEIFFER; Monog. Helic. Viv. ii. 390.

SHELL sub-cylindrical, elongated, thin, shining, longitudinally barred with crowded striæ, horn-coloured, and variegated near the suture with small dusky blotches. Spire obtuse at apex, composed of about nineteen narrow, nearly plane whorls. Aperture small, oblique, lunate, somewhat effuse at base, with a lamellar plate revolving posteriorly; columellar fold moderately developed, bilamellate. Umbilicus minute.

Length an inch and a half; breadth one-third of an inch.

Inhabits Brazil.

At first sight this shell would be taken for *Megaspira elatior*, Spix. On comparison it is found to be smaller, less tapering, having nineteen whorls instead of sixteen within the same space; its diameter is at least one-third less, its surface is more glossy, and more delicately barred, and it has only a few dot-like blotches near the suture, instead of stripes across the whorl. The aperture is smaller, more oblique, and crescentic; the columellar fold is much smaller, and the lip is effuse in front of it, and it is made up of only two delicate plates instead of three conspicuous ones, as in *P. elatior*. The umbilicus is minute, while in the other it is quite large.

Figure 101, a view of the aperture. Figure 102, aperture of *P. elatior*.

VERTIGO TANTILLA (Gould).

Testa minima, sub-ovalis, albida, perforata: spira obtusa; anfractibus quatuor convexiusculis, supernis sub-clathratis, ultimo exiliter rugoso-granulato: aperturu sub-rotunda, peristomate everso; fauce dentibus quinque armatâ, quorum uno columellari, uno basali, uno labiali et duobus posticis.

Pupa (Vertigo) tantilla, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 197. March 1847. Expedition Shells, 33.

SHELL very minute, of an oval form, obtuse at summit, and composed of about four convex whorls, of which the upper ones are irregularly marked with delicate longitudinal bars, and the lower one, under a magnifier, appears to be roughened by minute, irregular granulations. Colour whitish. Aperture somewhat four-sided, rounded at the corners, the lip slightly expanding, and the throat armed with five teeth, one on the columella, one at the base, one on the outer lip, and two unequal approximate ones on the middle of the transverse lip. There is a small umbilical fissure.

Length of axis one-fifteenth of an inch; width one-twentieth of an inch.

Inhabits the mountains of Tahiti, at an elevation of two thousand feet. *Couthouy*.

This little shell, the only one of this type which has come to us from the Pacific region, has about the size and shape of *P. Gouldii*, Binney, and the same number of teeth; but two of them are on the transverse lip instead of on the pillar.

PUPA PEONUM (*Gould*).

Testa minuta, variabilis, ovata, plus minusve elongata, tenuis, lucida, nitida, fulvo-cornea, perforata: spira anfractibus sex convexis leviter striatis: apertura ovato-rotundata, posticè lamellam volventem gerens; labro simplici, ad columellam plerumque latè revoluta; columellâ vel nudâ vel lamellis transversis ad tribus instructâ.

Pupa peponum, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 197. March 1847. Expedition Shells, 34.

SHELL minute, very variable in its form and characters, thin, shining, lucid and fragile, of an ovate or much elongated ovate form, of a yellowish horn-colour, its surface delicately marked with lines of increment, and with an umbilicus which is sometimes quite small,

and at others very ample. There are from five to six moderately convex whorls. The aperture is rather small, from less than one-half to two-fifths the length of the shell, of a rounded ovate form: posteriorly there is usually a single plate, which revolves within the shell. The lip is simple, and usually widely reflected over the pillar. Columella rounded, and on some specimens a single transverse fold is observed; and sometimes even two and three are discovered.

Length about one-eighth of an inch; breadth about half the length.

Found abundantly on pumpkin vines, at the Sandwich Islands. Hilo, *Wilkes*; Oahu, *Brackenridge*.

This interesting little shell is of somewhat doubtful genus. It may prove to be of the genus *Tornatellina* or *Elasmatina*. Its very variable characters render a decision difficult. But it belongs to the old genus *Pupa*, where I at present place it.

Figure 104, front view of an elongated specimen, magnified; 104 *a*, a short specimen, magnified; 104 *b*, natural size; 104 *c, d, e*, enlarged views of the aperture.

HELICINA UBERTA (*Gould*).

Testa parva, solida, sub-globosa, lævis, dilutè citrina; spira anfractibus quatuor; suturâ impressâ: apertura parva, semilunaris, extrinsecus constricta; peristomate simplici, vix reflexo; columellâ callo flavo copiosissimo, haud appresso, indutâ.

Helicina uberta, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 202. March 1847. Expedition Shells, 37. *Helicina constricta*, PFEIFFER; Proceed. Zool. Soc., July 1848, p. 120.

A small, solid, smooth, nearly globular, pale greenish-yellow shell, very faintly marked by the lines of growth, having four whorls, the outer one large and well rounded at the periphery, with a fine but well-impressed suture; but chiefly remarkable for the quantity of bright yellow callus nearly covering the convex base of the shell in a tongue-shaped mass, not appressed to the shell. The aperture is

semilunate, made very small by a deep constriction just behind the lip, which is sharp, and very slightly reflexed, so that the opening seems thrust somewhat across the base of the shell.

Axis three-twentieths of an inch; breadth seven-fortieths of an inch.

Found on the mountains of the Sandwich Islands. Oahu, *Pickering*, *Case*. Maui, *Drayton*.

Very remarkable for the abundant golden-yellow callus, which forms a tongue-like projection across the base of the shell.

Figures 114, 114 *a*, 114 *b*, three views of the shell, enlarged; 114 *c*, natural size.

HELICINA MAUGERLÆ (GRAY); Zool. Journ., i. 251. SOWERBY; Thes. Conch. f. 55.

ANIMAL cream-coloured, very minutely punctate with pale brown.

Found at Tahiti at an elevation of 200 to 3000 feet, and at Tutuila. *Couthouy*.

Figure 112, shell, with the animal, magnified one-fourth.

HELICINA BERYLLINA (*Gould*).

Testa solidula, depresso-conica, infra convexa, ad peripheriam obtusè angulata, polita, albido-virens: spira anfractibus quinque planulatis, ultimo cito crescente; suturâ lineari: apertura magna, transversè semi-elliptica; peristomate simplici; callo columellari latè expanso.

Helicina beryllina, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 202. March 1847. Expedition Shells, 37.

ANIMAL bright yellow ochre, darker on back of head.

SHELL rather large and solid, depressed, about equally convex above and below, smooth and polished, white, tinged with beryl-green, especially at apex, and at the margin of the callus, also arranged somewhat

in faint revolving stripes on the last whorls. Whorls four, nearly flat, forming a low, acute spire, the last one enlarging very rapidly, and obtusely angular at periphery. Suture distinct, delicate. Aperture rather broader than high, semi-elliptical, lip sharp, simple, or a little everted. The columella projects, and from its point a callus sweeps off, covering most of the base of the shell. Operculum calcareous, bright beryl-green.

Breadth half an inch; axis three-eighths of an inch.

Found at the Feejee Islands.

Remarkable for its peculiar green tint, and the rapidly-enlarging exterior whorl, so that the two diameters are very unequal. It is rather large in size, and resembles *H. similis*, Sowb., in form.

Figure 111, shell, with the animal; 111 *a*, base of the shell.

HELICINA PALLIDA (*Gould*).

Testa lenticularis, solidiuscula, luteo-cinerea, inequaliter striata, epidermide tenuissimâ induta: spira depressa; anfractibus quinque acutè carinatis, planulatis: apertura semilunaris, ad columellam callosa; labro modicè reflexo.

Helicina pallida, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 202. March 1847. Expedition Shells, 37.

SHELL small, lenticular, not solid, about equally convex above and below, of a pale, yellowish-ash, or straw colour, lip reddish, surface rather dead, and marked with oblique, unequal lines of growth, and a few indistinct, elevated, rounded, revolving lines, covered with a very delicate, sallow epidermis. Spire depressed, whorls five, flattened, and scarcely distinguished by the suture, periphery acutely carinated. Aperture crescent-shaped, height and width about equal, lip moderately reflexed, but narrowed at base; not angular at carina. Columella short, direct, central region covered with callus.

Axis three-twentieths of an inch; breadth three-tenths of an inch.

Inhabits the Feejee Islands.

Resembles somewhat *H. miniata*, Lesson, which is more solid, polished, the lip simple, and the suture double. In shape and colour it is like *H. oxystoma*, Gray, but is smaller, and the lip not angular at the carina.

Figures 113, 113 *a*, 113 *b*, three views of the shell; 113 *c*, natural size.

HELICINA FULGORA (Gould).

Testa parva, lenticularis, acutè carinata, glabra, dilutè castanea, lineolis radiantibus angulato-flexuosis, propè suturam et ad carinam dilatatis, picta: spira depresso-conica, acuta; anfractibus quinque ad sex planatis: apertura lata, semilunaris; peristomate reflexo, flavido, ad basim rectangulari; columellâ rectâ, callo modico albido indutâ.

Helicina fulgora, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 201. March 1847. Expedition Shells, 36.

ANIMAL bright pale brown, punctate with reddish dark brown.

SHELL small, rather solid, smooth, and shining, convex above and below, and acutely carinated. Colour pale-chestnut, with pale-yellow, radiating, zigzag lines, which, near the suture, and at the periphery, are so dilated as to form two series of spots. The zigzag lines are conspicuous on the base also, but are rather undulated than zigzag. Spire an acute, much-depressed cone, composed of five to six flattened whorls, suture distinct. Aperture broadly lunate, somewhat angular outwardly, lip delicately reflexed, and joining the columella at a right angle. Columella vertical, and forming a large central triangular area; circle of callus pale, small, thin.

Axis one-eighth of an inch; base nine-fortieths of an inch.

Found among bananas at the island of Manua. *Couthouy*.

This species, with *H. laciniosa*, and *H. musiva*, belong to the same

group with *H. flammea*, Quoy. These are smaller, and more globular; the first has no reflected lip, and the second no radiations beneath.

Figure 106, shell, with the animal, and 106 *a*, side of the shell, magnified two and a half diameters; 106 *b*, pit at base of the columella; 106 *c*, natural size.

HELICINA MUSIVA (*Gould*).

Testa parva, solidula, sub-globosa, polita, rufo-viridis, supra lineolis flexuosis albidis radiata: spira anfractibus quatuor rotundatis: apertura lunata; peristomate reflexo, albido, ad basim rectangulari; columellâ rectâ.

Helicina musiva, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 201. March 1847. Expedition Shells, 36.

A small, rather solid, polished, sub-globular shell, similar in its colours and markings to *H. fulgora*, but is smaller, more globose, rounded at periphery, the light-coloured lines are less flexuous, not so delicate, the fawn-coloured and whitish stripes being about equal, and terminating at the rounded periphery. The aperture is smaller and less transverse, and there are but four whorls. The triangular space of the columella is ill-defined, and the callus is very delicate and glossy. It is distinguished from *H. laciniosa*, Migh., by its zigzag colours, its want of revolving lines, and its reflected lip.

Axis one-tenth of an inch; base three-twentieths of an inch.

Found among bananas at the islands of Manua and Upolu. *Couthouy*.

Closely allied to the preceding, but smaller, more globular, not carinated, and destitute of radiated colouring beneath.

Figure 107, shell, with the animal, and 107 *a*, front of the shell, magnified three diameters; 107 *b*, natural size.

HELICINA LACINIOSA (*Mighels*).

Testa parva, conico-globosa, solidula, cinnamomea lineis flexuosis luteis variegata: spira anfractibus quinque subplanulatis, ultimo angulato et striis elevatis duobus ad tribus cincto: apertura lunata; labro acuto, ad columellam expanso; operculo tenui, fulvo.

Helicina laciniosa, MIGHELS; Proceed. Boston Soc. Nat. Hist., ii. 19. Jan. 1845.

SHELL conic-globose, rather solid, of a cinnamon-brown colour, variegated with yellowish zigzag stripes. Spire composed of five flattened whorls, the last of which is obtusely angular at periphery, and has two or three raised revolving lines upon it. The aperture is lunate, the lip acute, expanding in the vicinity of the columella. Operculum thin, yellowish-brown.

Axis one-tenth of an inch; base three-twentieths of an inch.

Found at Kauai, Sandwich Islands. *Couthouy*. Waianai, *Pickering*.

Resembles the two preceding; but is distinguished from *H. fulgora* by being smaller and more globular, and from *H. musiva*, by the raised revolving lines, and by having zigzag markings both on the base and on the spire.

Figures 108, 108 *a*, 108 *b*, three views of the shell, magnified three diameters; 108 *c*, natural size.

HELICINA TROCHLEA (*Gould*).

Testa minuta, trochiformis, supra cinerea, costis acutis volventibus tribus vel quatuor (intervallis concavis, scabrosis) cincta, infra convexa, polita, citrina: spira anfractibus quatuor, ultimo ad peripheriam bicarinato: apertura sub-trigona; peristomate leviter reflexo; columellâ ad basim angulatâ, callo copioso indutâ.

Helicina trochlea, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 202. March 1847. Expedition Shells, 36.

SHELL minute, depressed, conical beneath, convex, smooth, and of a citron colour, somewhat radiately flamed with light and dark; above ashy-gray, and girdled with sharp, elevated ribs, of which there are three on the upper and five on the outer whorl, the two last forming a bicarinated periphery. The interspaces are roundly excavated, and barred by elevated lines of growth. There are four whorls, forming a low, acute, pyramidal spire. The aperture is rather large, of a somewhat triangular form, with the lip most delicately reflected. The columella projects a little, and is joined by the lip at an angle, and the base is coated by a well-marked callus.

Axis three-fortieths of an inch; base one-eighth of an inch.

Inhabits Metia or Aurora Island, under stones. *Couthouy*.

It has the size and nearly the form of *H. rupestris*, Pfeiffer, and is distinct from all other species by its well-marked, sharp, revolving ribs.

Figures 109, 109 *a*, 109 *b*, three views of the shell, enlarged; 109 *c*, natural size.

HELICINA MULTICOLOR (*Gould*).

Testa parva, solidula, conico-globosa, tenuissimè striata, citrina, interdum fusco-fasciata, vel omnino fusco-rubra, subtus convexa: spira anfractibus quatuor convexiusculis, ultimo ad peripheriam rotundato; suturâ impressâ: apertura lunata, lata; peristomate simplici, acuto, ad basim obtusè angulato; columellâ callo copioso indutâ.

Helicina multicolor, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 202. March 1847. Expedition Shells, 36.

ANIMAL cream colour, sometimes spotted with brown.

SHELL minute, rather solid, globose-conical, delicately striated with

lines of increment, of a lemon colour, or banded with reddish-brown, or entirely reddish-brown. Whorls four, slightly convex, separated by a well-marked suture, the outer one rounded at the periphery, but rather compressed. Beneath nearly as convex as above. Aperture rather broadly lunate; lip sharp and simple, angulated as it rises on the left, where it is broadly expanded into a rather copious callus.

Length of axis one-tenth of an inch; breadth three-twentieths of an inch.

Inhabits Tahiti and Eimeo. *Couthouy*.

Figures 110, 110 *a*, 110 *b*, three views of the shell, enlarged; 110 *c*, natural size, with the animal.

One of the smallest known species. It is like a small Singapore species, which has a smooth, depressed spire, solid shell, and rib-like carina about the periphery, and an expanding lip. It is principally remarkable for its variable colouring.

CYCLOSTOMA TIARA (*Gould*).

Testa solida, rudis, turbinata, distorta, sordidè alba, latè umbilicata: spira anfractibus quinque laxis, rotundatis, spiraliter liratis, supernis undulatis; inter liros lineis incrementalibus confertè clathratis: apertura circularis; peristomate simplici.

Cyclostoma tiara, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 204. March 1847. Expedition Shells, 37.

SHELL solid, turban-shaped, or depressed-conical, of a dirty, ashy white, the surface rude, usually having coarse and unequal revolving lines, and with the smaller whorls feebly undulated; the spaces between the revolving lines are closely barred by the lines of growth. There are six whorls, which are more or less carinated at the periphery, the last of which is somewhat distorted, and becomes nearly disjoined from the preceding near the aperture. The whorls are rounded below, and form a large and deep umbilicus, displaying all the whorls.

The aperture barely touches the penultimate whorl, and has a simple lip.

Length of axis half an inch ; breadth three-fourths of an inch.

Inhabits Upolu. *Couthouy*.

This rather large species stands at the head of a small group of rude and very variable species from the Pacific Islands. They have a bony structure, are coarsely indented and striated spirally, the whorls are often almost disconnected, and the umbilicus is so large as on the whole to approximate Solarium.

Figures 116, 116 *a*, two views of the shell.

CYCLOSTOMA STRIGATUM (*Gould*).

Testa solida, orbiculato-conica, pallidè beryllina, supra costulis cingulata, infra sub-planulata, umbilico amplo et carinâ acutâ impendente limitato perforata: spira anfractibus quinque convexis, suturâ benè discretis, ultimo propè aperturam despecto, ferè disjuncto: apertura circularis; peristomate simplici, everso, acuto.

Cyclostoma strigatum, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 204. March 1847. Expedition Shells, 38.

SHELL rather small, solid, globose-conical, of a greenish-white, or pale beryl colour; the surface above is fluted with regularly disposed rib-like ridges, of which there are about six on the last whorl, with the intervening spaces concavely excavated and finely barred with the lines of growth. There are about five convex, somewhat carinated whorls, separated by a well-defined suture; and the last one, just before it reaches the aperture, becomes somewhat detached, and curves inwards towards the axis. The base is somewhat flattened and smooth, or very minutely striated spirally. The umbilicus is large and tunnel-shaped, margined by a sharp, overhanging carina. The aperture barely touches the penultimate whorl, has a simple, sharp, slightly expanding lip. The operculum is thin, horny. The young specimens differ much from the adult, in being almost discoidal, with the umbilicus nearly as large as the aperture.

Length of axis three-tenths of an inch; breadth nine-twentieths of an inch.

Inhabits Upolu. *Couthouy*.

This is not half as large as *C. tiara*, and may be recognised by its uniform grooving and fluting, its sub-globose form, its plain, flattened base, and its tunnel-shaped umbilicus, bordered by an overhanging carina.

Figures 117, 117 *a*, two views of the shell; 117 *b*, side view of a young shell with the animal.

CYCLOSTOMA PLICATUM (*Gould*).

Testa parva, solida, rudis, pyramidata, cinereo-virens, plicis confertis obliquis rugata, et striis minutis volventibus cincta: spira acuta, anfractibus sex rotundatis et suturâ benè discretis, ultimo ad peripheriam rotundato; infra convexa et umbilico modico acutè marginato perforata: apertura circularis; peritremate simplici.

Cyclostoma plicatum, GOULD: Proceed. Boston Soc. Nat. Hist., ii. 205. March 1847. Expedition Shells, 38.

ANIMAL with a muzzle remarkably prolonged, so that at times it looks like a regular proboscis. Tentacles long and taper; eyes very distinct at external base; foot pale ochreous, upper part of head, neck, and sides a faint red.

SHELL small, solid, rude, pyramidal-conic, of a pale greenish ash-colour, the whole surface striated with fine revolving raised lines, most prominent on the upper whorls, while the two larger whorls are closely and regularly undulated obliquely with prominent folds which are continued upon the base. Whorls six, convex, distinctly defined by the suture, rounded at the periphery. The base is convex, and perforated by a rather contracted, tunnel-shaped umbilicus, which is defined by an acute margin. The lip is acute and simple, very slightly everted.

Axis and diameter two-fifths of an inch.

Inhabits Upolu. *Couthouy*.

Differs from *C. strigatum* in its more elevated, acutely conical form, its plaited whorls without prominent revolving lines, its rounded periphery and base, and its more contracted umbilicus. The young are also discoidal, without folds, but with rather strong, somewhat nodular spiral lines, and the colour is of a bright beryl green.

Figure 118, shell with the animal; 118 *a*, 118 *b*, top and base of the shell.

CYCLOSTOMA OBLIGATUM (*Gould*).

Testa parva, crassa, sub-globosa, cinerea, arcuè perforata, utrinque sulcis et costulis acutis sub-crenulatis equalibus cincta, et lineis incrementi subtilissimis striata: spira acuta, anfractibus quinque rotundatis: apertura parva, ovata; peristomate simplici, crasso.

Cyclostoma obligatum, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 205. March 1847. Expedition Shells, 38.

SHELL small, very thick and solid, ovate-globose, of an ashy-white colour; the whole shell is sculptured with raised, revolving threads, and intervening grooves of about equal size; the threads or ribs are somewhat sharp, and with an edge slightly scalloped. There are five rounded whorls, forming an acute spire: the base is convex and polished; the aperture very small, about half the length of the shell, and of an ovate form, being acute posteriorly: lip thick and rounded. Umbilicus very small.

Length three-eighths of an inch; breadth one-third of an inch.

Inhabits Metia Island. *Couthouy*.

Still smaller than *C. plicatum*, and remarkable for its solid structure, its alternate coarse ridges and grooves, and its small, ovate aperture. It looks not unlike some specimens of *Littorina rudis*.

Figures 119, 119 *a*, two views of the shell.

CYCLOSTOMA DIATRETUM (*Gould*).

Testa planorboidea, albido-cornea, supra costis acutis remotis, ad intervallos cincinnè clathratis, cincta, latè umbilicata: spira planulata, anfractibus quatuor cylindraceis, cito crescentibus, propè suturam decliventibus: apertura circularis; peristomate simplici.

Cyclostoma diatretum, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 205. March 1847. Expedition Shells, 38.

SHELL discoidal, whitish, or pale horn-colour, solid; whorls four, rapidly enlarging, forming a flat spire, and sloping downwards to the suture; they are cylindrical, but the surface is made angular above by four smooth, distant, triangular ribs, and has the intervening concave spaces most delicately barred by the lines of growth: beneath concave, widely and loosely umbilicate, and striated with numerous revolving, raised lines. Aperture large, circular, very oblique, barely united to the preceding whorl; lip simple.

Length one-fifth of an inch; breadth two-fifths of an inch.

Found at Sandalwood Bay, Feejee Islands. *Drayton*.

Answers very nearly to the description of *C. orbella*, Lam. The whorls increase more rapidly, the costæ are more distant above, and the umbilicus is less broad and open.

Figures 124, 124 *a*, 124 *b*, three views of the shell.

CYCLOSTOMA ROSEUM (*Gould*).

Testa parva, solida, elevato-conica, glabra, pallidè rosea: spira acuta; anfractibus sex convexiusculis, supra arcuè tabulatis; suturâ benè impressâ: apertura spiram haud equans, ovata; peristomate everso, acuto; fissurâ umbilicali costâ circumambiente finitâ.

Cyclostoma roseum, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 205. March 1847. Expedition Shells, 39.

SHELL small, elevated, ovate-conical, rather solid, smooth, of a pale rose-red, or flesh-colour. The spire is composed of six whorls, which are a little convex, and have a decided, but very narrow shoulder at the suture. Aperture less than half the length of the shell, ovate, acute posteriorly, coloured as exteriorly; lip pale, not reflexed, but somewhat everted to form a sharp edge. The umbilicus enters by a very long, narrow channel, running behind the inner lip, and bounded outwardly by a delicate rib.

Length of axis seven-twentieths of an inch; diameter one-fifth of an inch.

Inhabits the Feejee Islands.

This shell, with several others from the Pacific Islands, forms a group characterized by their slender, elevated form, and the rib which circumscribes the umbilical region. It is more deeply and uniformly coloured than *C. rubens*, Quoy, which is also smaller, thinner, and has a much larger umbilicus.

Figure 121, front view of the shell, enlarged; 121 *a*, side view of the last whorl, enlarged; 121 *b*, natural size.

CYCLOSTOMA TEREBRALE (Gould).

Testa parva, turrita, acuminata, flavida vel dilutè cornea, laevigata, umbilico rimato circumvallato perforata: spira elevata, acuta, anfractibus sex ad octo convexiusculis, anticè sub-angulatis, sese partim obtegentibus; suturâ impressâ: apertura sub-rotunda, posticè angularis, campanulata; peristomate simplici, anfractui penultimo latè adnato.

Cyclostoma terebrale, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 206. March 1847. Expedition Shells, 39.

SHELL small, elongated, acutely turreted, pale-yellowish or watery horn-colour; whorls seven, obtusely angular below the middle, espe-

cially the upper ones; moderately convex, somewhat contracted posteriorly, so that each whorl overhangs a little the succeeding one in a sort of imbricated manner; acuminate at tip. Aperture rather large, nearly round, a little angular behind, orange within. Lip simple, campanulate, touching the preceding whorl about one-quarter of its circuit. Umbilicus free, fissure-like, margined by a faint angle.

Breadth one-tenth of an inch; length one-fourth of an inch.

Found at Tahiti and Eimeo, at an elevation of 3500 feet. *Couthouy*.

Distinguished from other similar species by its acuminate spire, angular, imbricated whorls, and expanded aperture. Its general form and appearance is like *Pupa fallax*, Say.

Figure 120, an elongated specimen, and figure 120 *a*, a short specimen, enlarged; 120 *b*, natural size.

CYCLOSTOMA VALLATUM (*Gould*).

Testa parva, solida, elongato-conica, lucida, fusco-cornea: spira anfractibus sex convexis, sub-angulatis, ultimo costâ validâ umbilicum ambiente munito: suturâ profundâ: apertura obliquè ovata; peristomate continuo, simplici, campanulato.

Cyclostoma vallatum, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 206. March 1847. Expedition Shells, 39.

SHELL small, ovate, elongated, rather thin, translucent, polished, bronzy horn-colour, umbilicate. Whorls six, convex, the last whorl with an obtuse angle at the periphery, which also appears near the suture of the other whorls as it winds up the spire. There is also, revolving about the umbilicus, a rib-like ridge; suture channeled. Aperture obliquely ovate, with the lip continuous and slightly expanded, but not reflexed.

Length of axis one-sixth of an inch; diameter one-twelfth of an inch.

Inhabits the Tonga Islands. *Drayton*.

Very similar to the next species, but smaller and less ventricose, smoother and horn-coloured, and with one whorl less, and moreover the umbilicus is margined by a rib. It is smaller than *C. terebrale*. It is possibly the *C. dubium* of Pfeiffer, though he describes the peristome as interrupted.

Figure 122, front view of the shell, enlarged ; 122 *a*, natural size.

CYCLOSTOMA SCITULUM (*Gould*).

Testa parva, elongato-conica, tenuis, rufo-cornea, striis incrementi tenuibus solum insculpta, arctè umbilicata : spira elevata ; anfractibus sex vel septem rotundatis, supernis sub-angulatis ; suturâ profundâ : apertura rotundato-ovata, parva, trientem longitudinis adequans ; peristomate simplici, pallido.

Cyclostoma scitulum, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 206. March 1847. Expedition Shells, 39.

SHELL minute, thin, elongated, ovate, covered with a delicate reddish horn-coloured epidermis, exhibiting faint and irregular lines of increment of a paler colour. Spire elevated, of nearly seven rounded whorls, separated by a deep suture, the upper ones somewhat angular posteriorly ; aperture small, rounded-ovate, about one-third the length of the shell. Lip simple, pale, united with the penultimate whorl on the columellar side for a considerable space. Umbilicus elongated, very small.

Length one-fifth of an inch ; breadth exceeding one-tenth of an inch.

Found at the islands of Tahiti, Eimeo, and Manua. *Couthouy*.

Almost exactly like *Amnicola Sayana*, Anth. It is larger and more ventricose than *C. vallatum*, and is distinguished from *C. terebrale* by its less slender form and unexpanded lip.

Figures 123, and 123 *a*, two views of the shell, enlarged ; 123 *b*, natural size.

TRUNCATELLA VITIANA (*Gould*).

Testa decollata, conico-cylindracea, solidula, flavido-cinerea; spira anfractibus superstitibus quatuor vel quinque planiusculis, costulis subrectis, elevatis, obtusis ad triginta clathratis: apertura obliqua, rotundato-elliptica; peristomate expanso, continuo, anfractui penultimo haud adnato, costâ marginato quæ posticè ad suturam producta est: operculum laminatum.

Truncatella Vitiana, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 208. March 1847. Expedition Shells, 40.

SHELL rather large and solid, decollated, cylindrico-conical, of a pale yellowish, or dirty ash-colour. Whorls remaining after truncation about four or five, slightly convex, barred with about thirty nearly straight, elevated, obtuse ribs, some of which, on the last whorl, are lost before attaining the base. The aperture is obliquely rounded, elliptical, entire; the lip trumpet-shaped, rather widely distant from the penultimate whorl on the pillar side, margined by a rib which, on the outer side, is continuous not only with the left lip behind, but also passes on till it reaches the regular course of the suture, so that, when viewed at the right side of the aperture, it does not seem disjoined from the preceding whorl; umbilical region slightly angulated.

Length three-tenths of an inch; diameter one-tenth of an inch.

Inhabits the Feejee Islands, where it is very abundant.

One of the largest species, distinguished especially by the peculiar manner in which the outer lip forms its junction posteriorly; the ribs also become fused posteriorly, so that the intervening flutings do not always reach the suture.

It varies much in size, but not in sculpture. It is not very different from *T. valida*, Pfeiffer, but it can scarcely be said to be carinate at base, and is in no degree umbilicated.

Figure 126, front view of the shell, enlarged; 126 *a*, last whorl, enlarged; 126 *b*, natural size.

TRUNCATELLA AURANTIA (Gould).

Testa parva, decollata, conico-cylindracea, aurantia, sub-perforata, longitudinaliter confertim clathrata; clathris elevatis, rectis, numero ad quadriginta in singulis anfractibus: spira anfractibus quinque convexis: apertura obliqua, ovata; peristomate albo, continuo, reflexo.

Truncatella aurantia, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 208. March 1847. Expedition Shells, 39.

SHELL small, elongated, conic-cylindrical, orange-coloured. There remain five whorls after truncation, which are quite convex, and barred longitudinally with erect, elevated cross-bars, about forty in number on each whorl. Aperture oblique, oval; lip white, slightly reflexed, continuous, advancing at base, thickened on the left margin, where it covers a slight umbilical chink; base angular.

Length three-tenths of an inch; breadth one-tenth of an inch.

Obtained at Mangsi Island, near Borneo. *Pickering*.

Its principal characters are its large size, very convex whorls, and very numerous bars. *T. Caribbeorum*, Sowb., is often of the same colour, but is more robust, the whorls less convex, and the bars less numerous and less elevated.

Figure 125, front view of the shell, enlarged; 125 *a*, side of the last whorl, enlarged; 125 *b*, natural size.

TRUNCATELLA PORRECTA (Gould).

Testa parva, elongata, sub-cylindrica, decollata, albida; spira anfractibus superstitibus quatuor convexis, clathris humilibus acutis ad sexdecim instructis, ad intervallos minutissimè et longitudinaliter striatis: apertura rotundato-lunata, anfractui penultimo latè sejuncta; peristomate continuo, extorsum expanso: operculum laminis arrectis radiantibus eccentricis ornatum.

Truncatella porrecta, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 208. March 1847. Expedition Shells, 40.

SHELL small, very slender, subcylindrical, rather thin, decollated at apex, dirty white, remaining whorls four, unusually convex and separated by a profound suture, barred with about sixteen delicate, sharp, humble ribs, the intervening spaces, when viewed by a strong magnifier, minutely striated lengthwise. Aperture rounded-lunate, stretching to some distance beyond the penultimate whorl; lip continuous, broadly expanded on the outer side, erect on the columellar side, leaving the penultimate whorl at some distance. The operculum is bony, eccentric, and its elements rise into sharp, elevated laminæ.

Length one-fourth of an inch; diameter three-fortieths of an inch.

Inhabits Tahiti.

The distinguishing marks of this shell are its slender form, its sculpture, the unusually rounded whorls, and the great protrusion of the last whorl. Only one specimen was examined.

Figure 127, front view of the shell; 127 *a*, side view of the last whorl; 127 *b*, aperture, with the operculum, all enlarged; 127 *c*, natural size.

TRUNCATELLA ROSTRATA (*Gould*).

Testa parva, conico-cylindracea, nitida, decollata, incarnata, obliquè clathrata; clathris ad duodecim robustis: spirâ anfractibus quinque convexiusculis: apertura parva, obliquè ovata; peristomate continuo, crasso, albido, duplici, reflexo.

Truncatella rostrata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 209. June 1847. Expedition Shells, 40.

SHELL small, elongated, conical, flesh-coloured, barred somewhat obliquely with about twelve stout bars on each whorl, which disappear before reaching the base. Whorls about five, slightly convex, the apex detruncate. Aperture small, obliquely ovate; lip large,

double, reflexed, continuous. The secondary lip being very robust, distant from the true lip, in profile looks like an obtuse spine or beak, at the base of the shell.

Length nine-fortieths of an inch; diameter three-fortieths of an inch.

Found at Rio Janeiro. *Couthouy*.

In size and colour this species much resembles *T. Cumingiana*, Adams, which has been pronounced to be a variety of *T. scalaris*, Michaud; but that shell is smaller, has only eight bars, which are whitish, more elevated, and acute; and unless that species is subject to extraordinary variation, must be regarded as different.

Figure 128, front of the shell, enlarged; 128 *a*, side of last whorl, enlarged; 128 *b*, natural size.

PLANORBIS VERMICULARIS (*Gould*).

Testa parva, fornicata: spira planulata, apice depresso; anfractibus quatuor, cylindræis, ultimo propè aperturam deflexo: subtus concava: apertura perobliqua, elliptica.

Planorbis vermicularis, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 212. June 1847. Expedition Shells, 42.

SHELL small, dome-shaped, minutely striated by growth, white, (probably bleached by the liquor from which it was taken;) whorls four, breadth and height about equal, the last one deflected near the aperture, rounded at periphery, tip depressed, suture very deep, the whorls sloping towards it; base cup-shaped, exhibiting all the whorls. Aperture exhibiting a very oblique section of a cylinder; lip embracing about one-half the height of the last whorl and joined by callus.

Diameter one-fifth of an inch; height one-fifteenth of an inch.

Found in the interior of Oregon. *Drayton*.

It is about the size of *P. deflectus*, Say, but is less depressed, the whorls more cylindrical, not carinated at periphery.

Figures 131, 131 *a*, 131 *b*, three views of the shell.

PLANORBIS OPERCULARIS (*Gould*).

Testa parva, valdè depressa, castanea, supra planulata; apice depresso: subtus convexa, latè umbilicata, ad peripheriam marginata et obtusè carinata: spira anfractibus quatuor, suturâ benè impressâ sejunctis: apertura transversa, subrhomboida.

Planorbis opercularis, GOULD; Proceed. Boston Soc. Nat. Hist. ii. 212. June 1847. Expedition Shells, 42.

SHELL small, dextral, much depressed, lenticular, with a prominent, blunted keel at the periphery, defined by a marginal compressed line; tip sunken; beneath umbilicated for about one-third the breadth of base, showing three volutions, convex, surface rather rude and indented, marked with irregular, coarse, much arcuated lines of growth, and here and there a few obscure, raised, revolving lines; colour dark chestnut brown, a little clouded; whorls above four, slightly convex, suture well defined, impressed: aperture transversely subrhombic, lip above slightly declining, at periphery acute angled, beneath arched, lips embracing three-fourths of that part of the whorl which is beneath the carina.

Length one-fourth of an inch; diameter one-sixteenth of an inch.

Obtained from the Sacramento River, California.

Allied to *P. exacutus*, but is larger, less compressed and less delicate, and the periphery instead of being sharp-edged, has a blunted keel like *P. carinatus*.

Figures 132, 132 *a*, 132 *b*, three views of the shell.

PLANORBIS CORPULENTUS (SAY), Appendix to Long's Exped., 362

pl. 15. fig. 9. HALDEMAN, Monograph of Limniades (Planorbis), pl. 3, fig. 7-9.

ANIMAL dark emerald green, profusely dotted above and below with small white points, paler beneath. Head large, tentacles very slender.

Inhabits the Columbia River, Oregon. *Drayton*.

Figure 130, side view of the shell and animal; 130 *a*, the locomotive disc of the animal; 130 *b*, the head in outline.

PLANORBIS KERMAICOIDES (D'OREIGNY), *Amerique Merid.*, 350, pl. 45, fig. 1-4.

ANIMAL dusky olive green; beneath, paler at the centre and edges of the foot; head broad and pale.

Inhabits streams near Lima, Peru. *Couthouy*.

PLANORBIS FERRUGINEUS (SPIX), *Test. Brazil.*, pl. 18, f. 1, 2. D'OREIGNY; *Amer. Merid.*

The animal of this species is remarkable for the great length of its slender tentacles, and for the beauty of its coloration. Mr. Couthouy describes it as varying from a deep orange red to a bright, transparent cherry colour. A variety was found with the animal ashy-brown; and he figures a variety with both shell and animal of a deep bottle-green, though with some doubt as to its being the same species, as it seems to have fewer whorls and a coarser surface.

Mr. Couthouy remarks, that he was surprised to find how barren of mollusks all the fresh waters in this region are; for, though as many as forty different streams were explored, this shell, with a single Ampullaria and a single Melania were the only species detected.

PLANORBIS TRIVOLVIS (SAY); *Nicholson's Encyc.* iv., pl. 2, f. 2. *Amer. Conch.*, pl. 54, f. 2. HALDEMAN; *Limniades*, pl. 2, figs. 4-7, GOULD; *Inverteb. of Mass.*, 201, fig. 131.

Some incomplete specimens of *Planorbis* accord so exactly with the corpulent variety of *P. trivolvis* from Vermont, that I hesitate to regard them as distinct, though their broad separation in space would indicate it. They are thin and delicate, and the whorl rises so much, when lying in the dextral position, that the aperture surmounts the preceding whorl by nearly one-third its height. They are also of a very light, almost white colour. More numerous and more perfect specimens are requisite for a more satisfactory decision.

PHYSA VENUSTULA (*Gould*).

Testa parva, ovata, pellucida, nitida, dilutè cornea: spira elevata, anfractibus quinque ventricosis, posticè subangulatis; apertura ovata; columellâ validâ, albidâ, vuldè sinuatâ.

Physa venustula, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 215. June 1847. Expedition Shells, 43.

ANIMAL not so long as the shell, yellowish-green, tinted on the back and near the margin with blue; beneath, with a submarginal band of sky-blue, blending at the edges with green. Head short and transverse; tentacles short and pale, mantle largely developed, with five or six deep digitations.

SHELL small, ovate, shining, pellucid, very pale yellowish horn-colour; the spire is one-half the length of the aperture, of an acute form. Whorls five, ventricose, and slightly shouldered posteriorly. The aperture is ovate, the outer lip deviating a little from a regular curve by a slight inflection; the pillar lip is strong, whitish, and forming a conspicuous sinus as it joins the whorl above. There is a slight approach to an umbilical perforation.

Length three-tenths of an inch; diameter three-twentieths of an inch.

Obtained in the vicinity of Lima, Peru. *Couthouy*.

This, though apparently a common species, I do not find to be de-

scribed. It closely resembles very small specimens of *P. heterostropha*, Say, though its form and texture is more like *P. fontinalis*, which, however, has a much shorter spire.

Figures 134, 134 *a*, two views of the animal and shell enlarged; 134 *b*, shell of the natural size.

PHYSA TABULATA (*Gould*).

Testa ovata, sub-solidâ, impolita, fuliginosa: spira anfractibus quatuor ad quinque ventricosis, supernè angulatè-carinatis, latè tabulatis: apertura elliptica, dimidium testæ longitudinis superans: columellâ albidâ, viz plicatâ; fauce fusco-castaneâ.

Physa tabulata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 214. June 1847. Expedition Shells, 42.

ANIMAL olive green, paler at edges, tentacles long and slender, eyes on prominent basal tubercles; mantle slightly fringed.

SHELL ovate, strong, nearly opaque, the exterior rather coarsely striated, and the surface of a dead, dusky brown colour, owing in part to the adhesion of dark earthy particles. Whorls four or five, ventricose, with a sharp, decided, carinated angle at some distance from the suture, so as to produce a very strongly marked scaffolding, and giving the shell a remarkably angular aspect. Aperture rounded, nearly oval, more than half the length of the shell, modified by the penultimate whorl, where it is covered by a thin callus. Columella whitish, rounded, nearly destitute of any fold; cavity of the shell very dark chestnut brown.

Length seven-tenths of an inch; diameter four-tenths of an inch.

Found in a mountain stream, Bay of Islands, New Zealand. *Drayton*.

Not to be mistaken for any other species. It is very much more angular than *P. ancillaria*, Say, and the keel upon the angle, when closely examined, is found to be minutely crenulated. It is very varia-

ble in size, like *P. variabilis*, Gray. But according to his description, it is the lower part of the whorl, instead of the upper, which becomes angular and keeled in that species.

Figure 136, front of the shell; 136 *a*, side, with the animal; 136 *b*, shell, natural size.

PHYSA GIBBOSA (*Gould*).

Testa obovata, tenuis, glabrata, luteo-cornea: spira acuminata, anfractibus quinque rotundatis, ultimo posticè valdè gibboso, anticè attenuato: apertura angusta, subovalis, trientes duas longitudinis adequans; columellâ sinuatâ, callo indutâ.

Physa gibbosa, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 214. June 1847. Expedition Shells, 42.

ANIMAL large; tentacles short; dark rusty-brown above; fawn-coloured beneath; mantle fringe not noticed.

SHELL of moderate size, obovate, rather thin, delicately striated, smooth, of a yellowish horn-colour. Spire drawn to a delicate point, composed of nearly six well-rounded whorls, the last of which is peculiarly dilated posteriorly, and forms an obtuse ridge at some distance from the suture; anteriorly it is much narrowed. Aperture rather narrow, about two-thirds the length of the shell, of an oval form. The columella is sharp, and has a small, whitish fold upon it, and the penultimate whorl is coated with enamel. Interior brownish.

Length five-eighths of an inch; diameter three-eighths of an inch.

Found in fresh-water streams at Paramatta, New South Wales. Presented by Mrs. Mitchill.

The resemblance to *P. ancillaria*, Say, in the younger specimens, is very striking, but the older ones are more like *P. tabulata*; the last whorl, however, is merely gibbous, and not angular. *P. Novæ-Hollandiæ*, Gray, is somewhat similar, but is much more elongated, and neither angular nor gibbous.

Figure 137, side of the shell, with the animal; 137 *a*, front view of the shell.

PHYSA SINUATA (*Gould*).

Testa parva, ovata, cornea, arcuatim striata: spira acuta; anfractibus quinque rotundatis posticè sub-angulatis; suturâ profundâ: apertura obovata, angusta, anticè sub-effusa, posticè emarginata; labro antrorsum arcuato; columellâ incrassatâ, sub-perforatâ, reflexâ.

Physa sinuata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 214. June 1847. Expedition Shells, 43.

SHELL small, rather solid, ovate, pointed at tip, reddish horn-colour, marked with arched striæ of growth. Whorls five, well rounded, and separated by a profound suture; aperture about two-thirds the length of the shell, narrow-ovate, acute posteriorly, and somewhat effuse at base. The lip arches forwards, when viewed in profile, leaving a very distinct sinus as it joins the preceding whorl. Columella broad and thickened, somewhat reflected, so as to give a faint appearance of an umbilicus; there is a thick deposit of callus on the inner lip. Columellar fold rather strongly marked.

Length half an inch; diameter one-fourth of an inch.

Inhabits the Feejee Islands. *Drayton*.

A well-marked species, especially remarkable for its thickened inner lip, and for the advancing outer lip, and consequent posterior sinus, and for the arched striæ of growth, which I have seen in no other species except *P. gibbosa*.

Figures 139, 139 *a*, 139 *b*, three views of the shell.

PHYSA RETICULATA (*Gould*).

Testa tenuis, elongata, ovato-conica, fulva, striis subtilissimis decussata: spira anfractibus quatuor ad quinque ventricosis; suturâ profundis-

simâ: apertura obovata, dimidiam testæ longitudinis vix superans; columellâ rufâ, valdè plicatâ.

Physa reticulata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 214. June 1847. Expedition Shells, 43.

SHELL rather large, thin, elongated, ovate-conic, of a brownish-yellow colour, somewhat shining, but roughened by crowded lines of growth, which are crossed, more especially in young specimens, by very minute revolving lines. Spire elevated; whorls five, of which one or two are often lost, quite ventricose, and separated by a very deep suture. Aperture rounded ovate, scarcely more than half the length of the shell. Columella reddish-brown, very strongly folded, and united to the outer lip by callus.

Length seven-tenths of an inch; diameter three-tenths of an inch; but it varies much in its dimensions. Another specimen measured six-tenths by three-tenths of an inch; another one-half by one-fourth of an inch.

Inhabits the Sandwich Islands; common.

Remarkable for its general colour, its coloured columella, its revolving striæ (which are not always seen on very old specimens), and its very tumid whorls, like a reversed *Limnea elodes*, Say.

In the Voyage de la Bonite, pl. 29, we have *Lymnée de Oahu*, figs. 38–41, and *L. (Physa) voisine*, figs. 42–44; the latter appears to be the young of the former. The animals of both seem to be alike, but are so indefinitely delineated that it is impossible to say whether it be truly a *Physa* or a *Limnea*. In a region where shells seem to take a direction to the right or left so indifferently, it would not be surprising to find reversed shells common in the fresh water, as well as on the land; and if here is an instance, I should decide, from its general figure, that this were a *Limnea* rather than a *Physa*.

Figure 140, an elongated specimen; 140 *a*, a short specimen; 140 *b*, the back of shell.

PHYSA VIRGINEA (*Gould*).

Testa elongato-ovata, tenuis, fragilis, lucida, nitida, alba: spira acuta, anfractibus quinque convexis, posticè subangulatis: apertura elongata, obovata, posticè acuta; columellâ leviter plicatâ.

Physa virginea, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 215. June 1847. Expedition Shells, 43.

SHELL slender and delicate, thin and shining, of a milk-white or porcelain-white colour: spire about one-third the length of shell, sharply pointed, of five or more moderately convex whorls, the last of which has a faintly angular appearance near the suture. Aperture narrow and elongated, two-thirds the length of shell, acute behind. Columella short, delicate, slightly sinuate, folded.

Length three-fifths of an inch; diameter one-third of an inch.

Inhabits the Sacramento River, California. *Lieutenant Budd.*

A very well-marked species, of a porcelain-like structure and colour, which appears not to be the consequence merely of blanching. It is less slender than *P. hypnorum*, and more like *P. gyrina*, Say, or *P. rivalis*, in form, but is a far more delicate shell, and one of the most elongated species.

Figures 138, 138 *a*, two views of the shell.

PHYSA RIVALIS (POTIER and MICH.), Galerie, 226, pl. 22, figs. 21, 22. D'ORBIGNY; Amer. Merid. 341. GRAY; Spicil. Zool. 1828.

ANIMAL much elongated, of an indigo-blue colour, pale greenish at the edges; head and tentacles small; mantle largely developed, and with numerous short fimbriæ, radiately striped with greenish and indigo.

Found in streams near Lima, Peru.

Figure 135, the animal with the shell.

LIMNEA LEPIDA (*Gould*).

Testa gracilis, elongato-conica, fragilis, dilutè cornea, striis volventibus remotis et striis incrementalibus undulosis decussata: spira acuminata; anfractibus quinque obliquis, convexiusculis: apertura magna, semilunaris, expansa; plicâ columellari pernotabili, acutâ.

Limnea lepida, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 211. June 1847. Expedition Shells, 41.

SHELL very fragile, elongated, very acutely conical, sub-umbilicate, pale horn-colour; whorls five, oblique, moderately convex, forming an acuminate spire; suture moderately impressed; surface smooth and shining, lines of growth faint, and when examined by a magnifier they are found to be rendered somewhat zigzag, by distant, revolving furrows which cross them. Aperture large and expanded, nearly semicircular, half the length of shell; outer lip expanded; columella having a very strongly marked, sharp fold, and broadly covered with a thin callus, which, not being closely appressed at the umbilical region, leaves a small chink.

Length three-fifths of an inch; breadth one-fourth of an inch.

Found at Lake Vancouver, Oregon.

Most closely allied to *L. pallida*, ADAMS, but is much more delicate, the spire more acuminate, the aperture larger and expanded, the fold of the pillar more developed, and the surface well characterized, when closely examined, by the flexuous lines. The whorls are much more oblique and less convex than in *L. desidiosa*.

Figures 141, 141 *a*, two views of the shell.

LIMNEA VOLUTATA (*Gould*).

Testa parva, tenuissimè striata, fulva, cylindraceo-ovata: spira decollata; anfractibus duobus ad tribus superstitibus obliquis, convexiusculis; suturâ modicâ: apertura ovata, dimidiam testæ superans; columellâ rufâ, valdâ sinuatâ.

Limnea volutata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 211. June 1847. Expedition Shells, 41.

SHELL small, ovate, somewhat cylindrical, as if it had been rolled, of a fawn-colour, the surface deadened by numerous, somewhat irregular, lines of growth. Several of the apical whorls are lost, and two or three only remain, which are somewhat more oblique than usual, not inflated, sloping in a gentle manner to the suture, which is but moderately impressed. Aperture broadly ovate, two-thirds the length of the shell, the columella of a palish-brown colour, and with a well-developed fold.

Length three-tenths of an inch; diameter one-fifth of an inch.

Inhabits the Island of Oahu, Sandwich Islands.

Much smaller than *L. Oahuensis*, Souleyet, and with less tumid whorls, sloping gently to the suture. The somewhat cylindrical aspect of the shell is peculiar.

Figures 142, 142 *a*, two views of the shell, enlarged; 142 *b*, natural size.

LIMNEA APICINA (LEA), Trans. Amer. Philos. Soc., vi. 102. pl. 23. fig. 94.

There is one small specimen which accords well with Mr. Lea's description. It was obtained in the interior of Oregon.

LIMNEA UMBROSA (SAY), Amer. Conch., pl. 31. HALDEMAN; Monog. of Limniades, 25. pl. 7.

Two or three imperfect specimens, apparently of this species, were brought from the Columbia and Sacramento Rivers. They are very thin and ventricose, and the aperture is at least half the length of the shell. Similar individuals may be found among New York specimens. It may be remarked, that all the land and fresh-water shells beyond the Rocky Mountains have a very fragile structure.

DOMBEYA FASCIATA (*Gould*).

Testa ovata, tenuis, ferrugineo-virens, fusco spiraliter fasciata, creberrimè plicato-striata et lineis volventibus minimis decussata: spira acuta; anfractibus sex ventricosis; suturâ pallidâ, marginatâ; apertura semilunaris; columellâ albâ, plicâ acutâ instructâ.

Dombeya fasciata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 211. June 1847. Expedition Shells, 41.

SHELL ovate, thin, shining, of a rusty greenish colour, with four or five narrow bands of dusky, and occasionally some undulating longitudinal ones. Surface finely plaited by the lines of growth, which are crossed by very minute revolving lines. Whorls six, very ventricose, forming an acute, entire apex. The suture is nearly white, and has a marginal impressed line. Aperture two-thirds the length of the shell, semilunar, being nearly as acute anteriorly as posteriorly. Columella white, sharp, with an acute fold above the middle. Interior whitish, displaying the brown bands of the exterior.

Length three-fourths of an inch; diameter three-eighths of an inch.

Found in the river Concon, Quillota, Chili. *Couthouy*.

Allied to *Chilina fluctuosa*, D'Orb. (*fragilis*, Gray), but is more regular in form, more ventricose, and more solid; and it is noted for its very minute revolving lines, its bands, and its pale suture.

Figures 145, 145 *a*, two views of the shell.

DOMBEYA OBOVATA (*Gould*).

Testa obovata, solidula, pallidè olivacea, longitudinaliter colore saturationis fulguratim virgata: spira curta, anfractibus sex convexis, ultimo magno, antrorsum attenuato, posticè sub-angulato: apertura magna, elongato-ovata; columellâ albâ, sub-rectâ, benè plicatâ: interior livescens.

Dombeya obovata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 211. June 1847. Expedition Shells, 41.

SHELL large, rather solid, opaque, obovate, of a pale olive-green, with numerous longitudinal, zigzag stripes of a dark colour; surface rather rude. Spire composed of six convex whorls, the last of which composes nearly the whole of the shell, and is broadest behind the middle, whence it gradually narrows anteriorly, and descends abruptly to the suture posteriorly, forming a faint obtuse angle. Aperture three-fourths the length of the shell, elongated ovate, much less curved on the columellar side; columella white, broadly flattened, nearly straight, so that the tip passes from it, in front, in an angular manner. Interior of a pale, livid flesh-colour.

Length seven-eighths of an inch; diameter half an inch.

Obtained from the river Concon, Quillota, Chili. *Couthouy*.

In size and marking it is similar to *Chilina major*, Gray; but is less broad, and the suture much less impressed. It is much larger and more ventricose posteriorly than *C. pulchra*, D'Orb., and much less pictured. The columella is more acute and simulates another tooth.

Figures 143, 143 *a*, two views of the shell.

DOMBEYA FLUMINEA (D'ORBIGNY), Amer. Merid., pl. 43, f. 19. *Chilina fluminea*, GRAY; Sowb. Conch. Ill., fig. 7. *Voluta fluminea*, MATON; Lin. Transactions.

ANIMAL short and stout, furnished with a broad, oval foot, a little broader anteriorly than behind. Respiratory orifice very large, on

the right median side of the collar. The head is separated by a fissure from the foot, over, and on each side of which, it projects in a broad, depressed, transversely oval lobe; mouth vertical, furnished with a surrounding oval, fleshy protuberance, like a lip; tentacles very short, obtusely conical; eyes very large and black, at the posterior base of the tentacles, a little on one side. On the right side of the animal is a tongue-shaped lobe, which, in crawling, projects obliquely backwards over and beyond the foot. Colour pale olive, with gray specks scattered over the foot and all visible parts of the body. Excrement slender, cylindrical, sometimes half an inch in length.

Placed in a jar of water, holding only half a pint, ten individuals remained in it twenty-five days in a healthy condition, without a change of the water. They continued for days together attached to the sides of the vessel, towards the bottom; and then again remained for as long a time above water. When below it, a bubble of air was always visible at the respiratory orifice, from which smaller bubbles would occasionally rise to the top. Two individuals placed in a dry box died, one on the fourth, the other on the sixth day. Two others placed in the same box with wet moss, lived, one for sixteen, and the other for twenty-two days. The animal was very sluggish in its motions, and when retracted was fully concealed in the shell.

[J. P. C.]

It is quite evident, from the above description and from the figure, that this animal belongs to the family Limniadæ, and is the analogue of the genus *Limnea* in the southern hemisphere, and that it has no affinity to *Auricula*, where it has usually been placed. D'Orbigny's name for the genus is the oldest; but as it has been already applied more than once in Botany, the name *Chilina*, subsequently given it by Gray, would have been preferable. The specimens were found in fresh water, in Patagonia, about six miles up the Rio Negro. I cannot make out that it differs from the descriptions and figures of specimens said to have come from Chili.

Figures 144, 144 *a*, two views of the animal, with the shell.

ANCYLUS ADUNCUS (*Gould*).

Testa exigua, obliquè conica, viridula, striis radiantibus et striis

concentricis decussata; apice acutâ, valdè incurvatâ: apertura ovato-rotundata.

Ancylus aduncus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 210. June 1847. Expedition Shells, 41.

SHELL very brittle, oval, conical, very faintly transparent; apex posterior, very prominent and strongly incurved, having numerous fine costæ radiating from it the whole distance to the margin, decussated by minute transverse striations, which, traversing the costæ, give the whole surface a closely reticulated aspect. Epidermis thick and adherent, of a dull, sap-green colour, projecting a little beyond the margin. Beneath this, the shell is of a pale yellow or straw-colour during life, turning after desiccation or exposure to the air to a dull white. Aperture ovoid, the posterior extremity slightly narrowed. Interior a dusky white, with a tinge of dull green reflecting through from the epidermis.

Length five-fortieths; breadth two-fortieths; height three-fortieths of an inch.

Abundant in mountain streams of Madeira, especially where there were little rapids, in which places they often cover the stones by hundreds, collecting in groups, one upon another, to the number, sometimes, of eight or ten. Apex often eroded and chalky. It was very difficult to detach them from the rocks without fracture. Not being provided with boxes to carry them separately, very few reached Funchal in good order, and no opportunity was afforded of observing the animal. [J. P. C.]

The very pointed, projecting, strongly-curved apex makes it to resemble the aculeus of a rose. It is not unlike *A. concentricus*, D'Orb.; Amer. Merid., pl. 42, figs. 19, 20.

Figures 495, 495 *a*, two views of the shell, enlarged; 495 *b*, natural size.

AMNICOLA BADIA (*Gould*).

Testa minuta, turrita, elongato-conica, badia: spira acuta, apice erosâ,

anfractibus quinque convexiusculis, ultimo vix angulato; suturâ impressâ: apertura ovata; peristomate continuo, obtuso, rufo.

SHELL minute, elongate, ovate-turreted, rather solid, of a Spanish-brown colour; spire of five or more whorls, forming an acute spire, eroded at tip, whorls moderately convex, shouldered above, the last indistinctly angular at periphery, imperforate; aperture one-third the length of the shell; peristome complete, edge black, thick; opercle sub-circular, eccentric; surface smooth.

Length one-fifth of an inch; breadth one-twelfth of an inch.

Obtained at Tipooka, Banks' Peninsula, New Zealand. Common in streams among plants. *Pickering*.

A small elongated species, like *Paludina Preissii*, of New Holland, or more like *Valvata pupoidea* in size, shape, and colour; but the opercle is that of *Amnicola*. Its colour, and dark, obtuse peristome, give rather prominent characters to a shell so small and so destitute of other marks.

Figures 150, 150 *a*, two views of the shell, magnified; 150 *b*, natural size.

AMNICOLA GRACILIS (*Gould*).

Testa minuta, elongato-turrita, tenuis, subperforata, epidermide viridescente nitida: spira acuta, anfractibus quinque convexis; suturâ profundâ; apertura ovata; peristomate continuo, labro acuto, subevaso.

SHELL minute, elongate, turreted, delicate, smooth, or with faint striæ of growth, covered with a thin, pale green epidermis: spire acute, whorls five, convex, the last one half the length of the shell, and partially perforate; aperture ovate, one-third the length of the shell; peristome entire, acute, rising before an indistinct umbilical chink, one-third the length of the shell, somewhat evasive.

Length of axis one-fifth of an inch; breadth one-tenth of an inch.

Found on plants in fresh-water streams, Banks' Peninsula, New Zealand. *Pickering*.

More slender, and less solid, than *A. badia*, as well as of an entirely different colour. It is very like *Paludina acuta* of Europe.

Figures 151, 151 *a*, two views of the shell, enlarged; 151 *b*, outline of the shell, natural size.

AMPULLARIA COLUMELLARIS.

Testa ponderosa, imperforata, rhomboidali-ovalis, nitida, sed sub lente argutè reticulata, flavo-viridis et fasciis rubidis cincta: spira producta, anfractibus septem ventricosis: apertura semilunaris, trientes duos longitudinis testæ haud equans; columellâ rectâ, elongatâ, cylindraccâ, contortâ; labro flavido, evaso; fauce rufo-olivaceâ.

SHELL solid, rhomboidal oval, ventricose, imperforate, apparently smooth and shining, but when examined by a magnifier, it is found to be minutely reticulated with revolving lines; pale yellowish-green encircled with narrow reddish-brown bands, arranged somewhat in pairs: whorls seven, rounded, ventricose, a little shouldered at the sutures; spire produced; aperture less than two-thirds the length of the shell, semilunar; columella long, solid, rounded, with much callus above, and rolling outwards at base, which is produced and narrow anteriorly, somewhat effuse, both above and below; callus and margin of lip yellowish; interior wine-colour; lip campanulate, a little everted.

Length of the axis two and a half inches; diameter two inches.

Inhabits the Province of Maynas, Peru. *Couthouy*.

Remarkable for its elongated form, its solidity, its want of umbilicus, and the presence of a columella like the bulimoid helices, instead of the usual circular base.

Figures 147, 147 *a*, two views of the shell.

AMNICOLA COROLLA (*Gould*).

Testa parva, ovato-conica, fusca: spira acuta, anfractibus ad sex ventricosus, posticè constrictis, angulo submediano aculeos numerosos ordinatim radiantes gerente, instructis; suturâ haud impressâ: apertura rotundata; labiis continuis.

Melania corolla, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 223. June 1847. Expedition Shells, 44.

ANIMAL with a very long proboscis; tentacles flagelliform; eyes large, and on large basal pedicles; anterior angle of the foot largely developed; above, pale dove-colour; beneath, flesh-colour.

SHELL small, ovate-conical, turreted, of a dead dusky colour. Whorls about six, ventricose, the last large, and each one strongly angular and scaffolded posteriorly, the angle bearing a series of delicate radiating prickles, of which there are as many as twenty on the last whorl; apex acute; suture not impressed. Aperture rounded, ovate, scarcely effuse at base; lip simple, whitish, rounded on the inside, continuous, and slightly attached across the penultimate whorl.

Length three-tenths of an inch; breadth one-fifth of an inch.

Inhabits Banks' Peninsula, New Zealand. Common in fresh-water streams on plants. *Pickering; Brackenridge.*

This beautiful little shell, somewhat resembling *M. spinulosa*, is readily recognised by its coronets of numerous small radiating prickles on the angles of the whorls.

The form of the animal, the continuous lip and nearly circular aperture, and also the sub-spiral operculum, place it in the genus *Amnicola*, rather than *Melania*. A similar species was also found by Professor Adams, in Jamaica, which he has called *Melania spinifera*; and another, *A. ciliata*, Gould, by Dr. Perkins, in Liberia.

Figure 149, the animal seen from below; 149 *a*, animal with the shell, as in motion; 149 *b*, aperture of the shell.

CINGULA PETENINGENSIS.

Testa minuta, sub-perforata, elongato-conica, tenuis, levis, cinereo-viridis: spira anfractibus sex convexis; suturâ profundâ: apertura lunata, trientem longitudinis testæ adequans, antrorsum sub-producta; labiis posticè interruptis.

SHELL minute, smooth, elongate-conical, thin, of a grass-green colour when fresh, becoming ashy-green when dry. Spire composed of six convex whorls, separated by a deep suture; the last whorl a little more than half the length of the shell. Aperture about one-third as long as the shell, semilunar, a little produced anteriorly, the lips interrupted by the penultimate whorl. The axis is slightly perforate.

Length one-third of an inch; breadth one-tenth of an inch.

Found adhering to grass on the margin of Lagoa de Peteninga, about six miles from Rio de Janeiro, near the northern entrance of the harbour. The water is here quite saline, the sea breaking into the lake in storms. [J. P. C.]

The operculum is horny and sub-spiral. As it inhabits the vicinity of brackish water, I doubt not it must be grouped with *Turbo minutus*, Totten, and *Littorina balthica*, and not with *Melania*, as Mr. Couthouy conjectured. Several small shells of this character are figured by D'Orbigny, under the name of *Paludestrina*, but none of them accord with this species.

Figures 152, 152 *a*, two views of the shell, enlarged; 152 *b*, natural size.

MELANOPSIS ZELANDICA (Gould).

Testa solida, ovato-conica, nitida, olivacea, fusco-trifasciata: spira conica, brevis, acuta; anfractibus tribus, supernis planulatis et ad suturam confluentibus; ultimo magno, posticè planulato, anticè ventricososo: apertura elliptica, cærulescens, rufo-fasciata, posticè in canalem

obducta; labro acuto: columella valdè arcuata et excavata, posticè callo tuberculoso copioso instructa.

Melanopsis Zelandica, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 225. July 1847. Expedition Shells, 47.

ANIMAL with an oblong foot, rounded at the corners, about half the length of the shell, of an ochreous, lilac-tinted colour, beautifully and thickly dotted with slate-colour. Anterior angles very slightly developed, head half the width of the foot, trapezoidal, beautifully dotted with scarlet; tentacles subulate, half as long as the foot, with six or seven dark annuli; eyes on short, large pedicles at the outer base of the tentacles: above, pale reddish-brown, with pale granular dots, arranged in longitudinal lines, as in the *Limneidæ*.

SHELL solid, ovate-conic, shining, olive-coloured, with three dusky bands. Spire short, conic, acute; whorls three, the upper ones flattened and confluent at the suture, the lower whorl large, posteriorly flattened, anteriorly ventricose, and nearly the whole length of the shell. Aperture elliptical, channeled posteriorly, bluish within and banded with chestnut-brown; lip acute; columella excavated and strongly arcuate, posteriorly bearing a tubercular mass of callus.

Length nine-tenths of an inch; diameter nine-twentieths of an inch.

Inhabits New Zealand; common in fresh water.

A well-marked species, distinguished principally by its short, conic spire of three whorls, its greenish banded surface, its arcuated columella, and the bluish colour of its brown banded aperture. Compared with *M. prærosa* (*M. levigata*, Lk.), it differs as follows: it is less elongated, has three whorls instead of six or seven; its colour is olive-green and banded instead of plain brownish; the last whorl is six-sevenths instead of three-fourths the length of the shell; the aperture is more elliptical, three-fourths instead of less than two-thirds the length of the shell; the columella is much more excavated and arcuated, so as to curve decidedly downwards when in the crawling position; the interior is bluish and banded instead of plain pale chestnut.

Figures 146, 146 *a*, side and base of the shell with the animal; 146 *b*, shell viewed by the aperture.

MELANIA CYBELE (Gould).

Testa ovata, turrita, crassa, fuliginosa, epidermide velutino induta: spira ad apicem valdè erosa, anfractibus superstitibus ad tribus planulatis, supernè tabulatis, et pinnis curtis acutis arrectis ordinatim dispositis coronatis: apertura angusta, elongato-ovalis, posticè angulata: intus livida.

Melania cybele, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 222. June 1847. Expedition Shells, 44.

ANIMAL above mottled grass-green, lemon, and slate-colour, darkest centrally, growing paler laterally, where it is lemon-yellow, the dark spots arranged longitudinally on the body and neck, but in delicate undulating transverse lines on the head; tentacles slaty and annulated; ocular pedicles large, lemon-coloured; points of the mantle much developed, yellowish and dotted; foot beneath, pale brick-red.

SHELL rather large and solid, dusky black, ovate. It is greatly eroded at the summit, and only about three whorls are left. These are flattened, with a broad, flat shoulder above, the angle of which is crowned by about twelve short, equal, obtuse spines, and these spines are the terminations of small, slightly oblique folds of the whorls. The epidermis is very delicately striated spirally, and where not chafed, the striæ will be found garnished with short, equal hairs, forming a velvety surface. The aperture is narrow oval, slightly effuse in front, and modified by the staging behind; interior livid. Lip sharp, and there are few deep revolving furrows in front.

Length one inch; breadth five-eighths of an inch.

Inhabits the Feejee and Samoa Islands. *Couthouy; Drayton.*

Probably confounded with *M. amarula*. That shell is lighter coloured, shorter, smoother, and destitute of the velvety epidermis: the spines are less numerous, longer and sharper, and stand out somewhat obliquely; in this species they are erect, and resemble mural battlements.

Figures 154, 154 *a*, two views of the shell; 154 *b*, the animal; 154 *c*, the operculum.

MELANIA TETRICA (Gould).

Testa oblonga, turrita, ponderosa, fusca, liris paucis cincta: spira truncata, anfractibus superstitibus tribus ad quatuor convexiusculis, posticè sub-angulatis et spinis validis acutis quinque ad basim decurrentibus armatis, interdum muticis: sutura profunda: apertura arcuè elliptica; intus livida.

Melania tetrica, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 222. June 1847. Expedition Shells, 44.

SHELL oblong, turreted, solid, dusky brown, composed of three or four whorls, besides several at the summit removed by erosion. Whorls elongated, somewhat convex, obtusely angular above. On the angle are about five long, sharp, stout, diverging spines, which are generally more or less eroded, and sometimes entirely removed, leaving the shell unarmed. There are a few unequal, longitudinal folds or ridges, generally originating from the base of the spines and extending but a short distance. Suture profound. There are also coarse, raised, revolving striæ, larger towards the base, and alternately larger and smaller. Aperture narrow, elliptical; lip sharp; interior livid.

Length one inch and one-fourth; breadth five-eighths of an inch.

Inhabits the Feejee Islands.

More slender than the preceding, and with more convex whorls. It has nearly the same form as *M. bellicosa*, Hinds, but is larger, less plaited, and has fewer spines. It is especially distinguished by its few stout spines directed outwards. Some specimens are much like *M. Winteri*, Von den Busch.

Figures 153, 153 *a*, two views of the shell; 153 *b*, an unarmed specimen.

MELANIA TERPSICHORE (Gould).

Testa elongato-turrita, solidula, olivacea, plagis flexuosis fuscis picta,

longitudinaliter creberrimè plicata, et liris elevatis versus basim crescentibus cincta: spira elevata, ad apicem erosa; anfractibus quatuor posticè subangulatis: apertura angusta, elliptica, testæ longitudinis trientem adequans; intus cærulescens.

Melania terpsichore, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 222. June 1847. Expedition Shells, 44.

SHELL elongated, turreted, solid, olive-green, with flexuous longitudinal, dusky stripes between the folds, sometimes banded also with numerous well-marked, crowded, acute, longitudinal folds, fifteen to twenty or more in number, and everywhere covered with coarse, raised, revolving lines, which cross the folds, and render them somewhat beaded, and which are coarser, and often alternately larger and smaller towards the base. There are about four moderately convex whorls, and the apex is much eroded. There is a slight angle above the middle, where the revolving line rises into a small, sharp tubercle. Aperture about one-third the length of the shell, narrow elliptical, bluish within; lip sharp.

Length one inch; breadth one-fourth of an inch.

Inhabits the Feejee and Samoa Islands.

Of the same group as the preceding, but more slender, and remarkable for the lyrate appearance produced by its numerous folds, decussated by revolving lines, one of which, more conspicuous than the rest, forms a sort of beaded angle.

Figures 155, 155 *a*, two views of the adult shell; 155 *b*, a young specimen.

MELANIA SCIPPIO (*Gould*).

Testa magna, solida, lanceolata, truncata, picea, sursum rufescens et flammulis longitudinalibus fuscis magis ac magis picta (juvenibus valdè subulatis et epidermide tomentoso quoque indutis) creberrimè et minutissimè decussato-striata: spira anfractibus superstitibus quatuor

vel quinque (totis duodecim ad quindecim) planulatis, obliquis: suturâ impressâ et marginatâ: apertura triangularis, valdè effusa, posticè sub-canaliculata; regione columellari tumido; columellâ planulatâ, acutâ, albâ: intus plumbea.

Melania scipio, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 224. June 1847. Expedition Shells, 45.

ANIMAL of a bright lemon-yellow above, beautifully lineated dark-green, concentrically above, and transversely on the proboscis, which is long, conical, bifid at tip; tentacles delicate, annulated; eyes small; snout below much as above; foot beneath, pale flesh-colour, dotted cream-colour; angles slightly developed, rounded behind, fringe of the mantle delicate.

SHELL large and solid, smooth and shining, of an elongated, regularly lanceolate form; colour pitchy brown, becoming paler posteriorly, till in its young stages it is fawn-colour, and also gradually exhibiting dark, longitudinal flammules, so that the young are beautifully variegated with fawn and black, in nearly equal proportions. The surface is beautifully reticulated by fine lines of growth, and by very minute, close-set, revolving lines; on the largest whorl the former approach to folds, and the latter are quite conspicuous about the base. The young, when fresh and uninjured, are found to be clothed with a delicate, velvety epidermis, a line of close-set hairs corresponding to each of the revolving striæ. There are about four or five whorls usually remaining in the adult state, though there are as many as twelve or fifteen in the whole growth; they are very oblique, scarcely convex, being in general continuous in outline with each other, though the suture is abrupt and has a slight contraction below it. The aperture is somewhat triangular, acute and contracted posteriorly; the lip sweeps largely forwards, while at the columella the wall is deeply emarginate, not channeled, so as to be remarkably effuse: the columellar region is very tumid, and the columella very much curved in front, flat, sharp, white. The interior is leaden blue.

Length in its usual state, an inch and a half, or three inches when entire; breadth half an inch.

Inhabits the Samoa and Feejee Islands.

I have been somewhat minute in the description of this species, which I think is distinct from several closely allied ones which have been described. Indeed, the young, intermediate, and old, are so different in this species, that they might well be regarded as distinct species when seen separately, as has been done in other instances. By means of a series of specimens, it is easy to trace the variations by age. It is most nearly allied to *M. funiculus*, Quoy, being about the same size and shape when entire; but the aperture is much longer and more acute posteriorly, and the surface is different; and *M. aspirans*, Hinds, which is a still larger and more solid shell, with more numerous and less convex whorls, darker and scarcely variegated in colour, and with but a few scattered, coarsish, revolving striæ; the aperture is similar, but the lip in old specimens has a yolk-yellow tinge. This shell may be known by its dark, pitchy colour in the three or four adult whorls, gradually changing to pale fawn-colour, with, at the same time, a development of dark flammules; the closely and minutely striated surface, seen only on close examination, and the velvety epidermis on fresh young specimens. It appears to be very common at the Samoa Islands, less so at the Feejees.

Figure 156, the animal and shell; 156 *a*, locomotive disc of the animal; 156 *b*, a young shell, with the animal, to show the velvet epidermis; 156 *c*, young shell, to show the colouring; 156 *d*, profile of the aperture; 156 *e*, the operculum.

MELANIA LUTOSA (Gould).

Testa crassa, elongato-turrita, striis tenuibus cincta, fusco-castanea, et crustâ laevi, lutosâ, crassâ, rubiginosâ, omnino oblecta: spira anfractibus septem superstitibus convexis; suturâ profundâ: apertura obovata, vix effusa, peristomate rufo-limbato; fauce lividâ: operculum crassum, osseum, subspirale.

Melania lutosa, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 223. June 1847. Expedition Shells, 45.

ANIMAL with the proboscis very large and broad, of an umber colour above, delicately lineated with white transversely; tentacles

rather stout, points of the mantle whitish, well developed: foot not much developed at the angles, orange beneath.

A simple, elongated, turreted shell, rather solid, of a dark rusty brown, somewhat shining exterior. On examination, it is found to be incrustated with a thick coat of earthy matter, which readily scales off. Beneath this is found a delicate true epidermis, of a dark chestnut-colour, and beneath it, the shell is grooved with fine spiral lines. The apex is detruncated, and there are about seven moderately convex whorls remaining, sloping to a simple suture. The aperture is about one-fourth or one-third the length of the shell, obovate, unusually rounded and entire at base. The throat is livid in the adult shells, and its entire circumference is margined by a rich brown, by which the species may be distinguished. The operculum is thick, approaching to bone, the apex marginal and basal, elements subspiral.

Length an inch and three-fourths; breadth half an inch.

Inhabits Upolu, Samoa Islands. *Couthouy*.

This simple and graceful shell, has much the form of *M. virginica*, Say, or *M. decollata*, Lk. It is well distinguished by the broad, deep brown margin to its whitish aperture, and by its bony operculum.

It is remarkable for the very thick earthy crust which envelopes it; it is so smooth, and so like the usual colour of these shells, as to be readily mistaken for the true surface of the shell. By examining the tip, its true nature is readily detected.

Figure 159, shell with the animal; 159 *a*, the animal seen from beneath; 159 *b*, profile of the aperture; 159 *c*, the operculum.

MELANIA CORPOROSA (*Gould*).

Testa subulato-conica, decollata, nitida, olivaceo-castanea, juxta suturam cerina, striis plerumque minimis decussata: spira anfractibus ad quinis convexiusculis; suturâ profundâ et marginatâ: apertura angusta, pyriformis, anticè vix producta; intus livida; columellâ albidâ.

Melania corporosa, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 223. June 1847. Expedition Shells, 45.

ANIMAL large, head remarkably broad and short; above purplish, margined with ochreous yellow; head longitudinally striped with black; beneath ochreous yellow; points of the mantle moderately developed, yellow. Tentacles very slender, pale, annulated, black.

SHELL simple, elongated, rather thin, shining, truncated at tip, of a pale chestnut-colour tinted with olive, and becoming paler, so that the base and the sutural region are of a wax-yellow colour. The striæ of growth are rather elevated, regular, and rounded, and these are crossed by fine, obsolete revolving lines, so as to give the surface a very finely reticulated appearance. The whorls which remain are about five in number, moderately convex, separated by a deep, channeled suture, with an impressed marginal line on each whorl just below it. The aperture is less than one-third the length of the shell, rather narrow, acute behind and nearly rounded in front. The interior is livid brown, except the columellar margin, which is pale.

Length an inch and a half; breadth half an inch.

Inhabits the island of Tahiti. *Couthouy*.

Very nearly of the same shape as *M. lutosæ*, but distinguished by its clean, shining, minutely reticulated surface, its pale sutural region, and its narrower aperture, destitute of the deep brown limbus.

Figure 161, shell, with the animal; 161 *a*, front view of the shell; 161 *b*, profile of the aperture.

MELANIA VAINAFA (*Gould*).

Testa elongato-conica, lævis, badia (junioribus herbaceis et lineolis flexuosis fuscis pictis): spira decollata, anfractibus quatuor ad quinque superstitibus, subplanulatis, ultimo plerumque striis distantibus cincto; suturâ marginatâ: apertura ovata, testæ quadrantem æquans.

Melania Vainafa, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 224. June 1847. Expedition Shells, 46.

ANIMAL small, chestnut-colour above, faintly lineated with dusky; proboscis long; tentacles slender, somewhat annulated; eyes surrounded with whitish; foot beneath orange, with cream-coloured dots, the points of the mantle very small; anterior angles of the foot a good deal dilated; operculum ovate-rounded.

SHELL long and slender, surface smooth, of a deep brown colour in old specimens, but of a yellowish-green colour, with longitudinal, flexuous pencillings of dusky, in young specimens. Spire eroded at tip, and with about four or five flattish whorls remaining. On the last whorl, and occasionally on some of the others, are seen a few distant revolving lines, either raised or depressed. The suture is moderately marked, and usually margined. Aperture about one-fourth the length of shell, regularly ovate, the anterior point scarcely produced beyond the regular curve. Interior bluish.

Length seven-eighths of an inch; breadth three-tenths of an inch.

Obtained at the falls of Vainafa, island of Upolu, Samoa Group. *Couthouy*.

It has the form and general colour of small, smooth specimens of *M. virginica*, but the whorls are more flattened, and the front of the aperture is more rounded.

Figure 157, side of the shell; 157 *a*, foot of the animal, with the shell; 157 *b*, the operculum.

MELANIA FURFUROSA (*Gould*).

Testa turrita, ovato-pyramidata, tenuis, scabriuscula, dilutè fulva, et propè suturam fusco-maculata, striis arcuatis incrementalibus et striis volventibus tenuissimis decussata: spira integra, anfractibus septem rotundatis, confertis, supernè sub-tabulatis; ultimo magno, ventricoso; supernis obliquè plicatis: apertura lunata, ad columellam effusa.

Melania furfurosa, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 225. July 1847. Expedition Shells, 47.

SHELL of medium size, rather fragile, of a pale fawn or wood-colour, with a range of darker spots just in front of the suture; tip dark; surface marked with unequal, arcuated lines of growth, which are crossed by crowded, raised, revolving striæ, by which innumerable little pits are left, which give it a dead, roughened aspect. Spire entire, rapidly tapering, pyramidal, of seven very transverse, very convex whorls, separated by a profound suture. The last is large and almost globular, a little more than half the length of the shell. The upper whorls are delicately and obliquely plicate. Aperture not quite half the length of the shell, obliquely lunate, effuse at the base of the columella. Interior pale cinnamon-colour.

Length three-fourths of an inch; breadth three-eighths of an inch.

Obtained at Manila.

Allied to *M. scabra*, which is more elongated, and its whorls much less cylindrical, its striæ coarse and distant, and crowned with spinotubercles.

Figures 162, 162 a, two views of the shell.

MELANIA SCITULA (*Gould*).

Testa gracilis, elongato-conica, decollata, epidermide piceo induta: spira anfractibus superstitibus ad quinque vuldè convexis, supernis longitudinaliter plicatis, infernis spiraliter liratis, præcipuè juxta suturam et ad basim: apertura obovata, quadrantem testæ haud æquans, anticè aliquanto producta; fauce livida.

Melania scitula, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 224. June 1847. Expedition Shells, 46.

SHELL slender, elongated, covered with a very dark chestnut or pitch-coloured epidermis. Spire with about five well-rounded whorls, several others being lost from the apex. The upper whorls are longi-

tudinally plaited, and all of them have fine, raised, revolving lines, most conspicuous near the suture, and about the base; the suture is deep, and in most cases there is a conspicuous slope of the whorls towards it, both above and below. The aperture is less than one-fourth the length of the shell, of an ovate form, rounded or very slightly projecting in front. The lip is sharp, and the throat livid.

Length seven-eighths of an inch; breadth one-fourth of an inch.

Found at the island of Upolu, Samoa Group. *Couthouy*.

It has the form and size of *M. abjecta*, Hald., from Alabama; also, of *M. truncatula*, Lam. It is more robust, paler, and the folds are more prominent and on more whorls than in *M. plicata*, Lea.

Figures 158, 158 *a*, 158 *b*, three views of the shell.

MELANIA SILICULA (*Gould*).

Testa parva, gracilis, sub-cylindrica, truncata, epidermide fusco-castaneo induta: spira anfractibus ad quatuor superstitibus, rotundatis, spiralliter liratis, supernis longitudinaliter plicatis; ultimo fusco-zonato; suturâ benè impressâ: apertura rotundato-ovata, anticè vix producta; fauce subviolaceâ.

Melania silicula, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 224. June 1847. Expedition Shells, 46.

A small, slender, nearly cylindrical species, covered with a somewhat clouded, dark chestnut epidermis. There are about four entire whorls, several others being lost from the tip; they are well rounded, and marked with numerous, fine, revolving threads, and all but the two largest ones are longitudinally plaited. The aperture is small, rounded-ovate, scarcely produced in front, and about one-fourth the length of the shell. The throat has a pale violet tint. The last whorl has a dark, narrow band around it, just at the junction of the lip to it.

Length half an inch; breadth one-fifth of an inch.

Found at Nisqually, Oregon.

Very much like *M. scitula*, but considerably smaller, more cylindrical, the whorls more plaited, and with a band on the basal one. It resembles *M. proxima*, Say, which is less cylindrical and without folds.

Figures 164, 164 *a*, two views of the shell.

MELANIA BULBOSA (*Gould*).

Testa parva, conico-oblonga, nitida, decollata, fusco-viridis: spira anfractibus superstitibus duobus ad tribus rotundis; suturâ profundâ: apertura ovato-rotundata, vix effusa.

Melania bulbosa, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 225. July 1847. Expedition Shells, 46.

A small, smooth and shining, rather solid, oblong-ovate shell, of a dusky green colour, with remarkably rounded, full whorls, separated by a deep suture; only two or three whorls remain. The aperture is not quite half the remaining length of the shell, broadly ovate, its wall scarcely depressed in front, and its posterior angle rounded by the very curved contour of the whorl; interior dull bluish-white.

Length half an inch; breadth nearly as great.

Inhabits Columbia River, Oregon. *Drayton*.

The whorls are very cylindrical, with a deep suture, so as to appear like a succession of bulbs. It is much like *M. perfusca*, Anthony; but in that the whorls slope gently to the suture. A large but broken specimen shows that it often attains a considerable size.

Figures 163, 163 *a*, two views of the shell.

MELANIA PERPINGUIS (HINDS), Ann. Nat. Hist., xv. 9. Voyage of the Sulphur, 56, pl. 15, f. 2.

ANIMAL very much like *M. scipio*, perhaps a little more orange, with similar concentric lineations of brown; tentacles dotted rather than annulated; foot, in the young, nearly rose-red; fringes of the mantle long.

Mr. Hinds has described a medium-sized specimen of this very variable species, so variable that some notice of the varieties is required.

Its essential character is the grooves upon the surface, which are distant, irregular, deep, with abrupt walls, and these being crossed by pronounced lines of growth, give a minutely cancellated appearance. The grooves cover the whole, or more generally the lower portion, of the whorls. The colour is olive-green, sometimes banded with dusky, and sometimes with longitudinal flammules; sometimes without either.

The whorls are gracefully rounded in most cases, but some have them perfectly flattened, and in consequence are angular around the last whorl. The suture is deep and broad, with an abrupt ridge at the top of each whorl. In the young stages, doubtless, several of the apical whorls are always folded; but in some, well-marked folds are found on all the whorls except the largest. Some correspond accurately with Hinds's figure in size and colour; but he does not dwell on its constant character,—the grooves. Some very old, and probably injured, specimens have a scabrous surface, with raised instead of grooved lines. One specimen is three-fourths of an inch broad.

Inhabits the Feejee and Samoa Islands, and apparently is very abundant.

Figure 160, shell with the animal, as in motion; 160 *a*, young specimen; 160 *b*, oblique view of the aperture; 160 *c*, young.

MELANIA PLICIFERA (LEA), Trans. Am. Philos. Soc., vi. 93, pl. 23, f. 90.

This shell seems to be subject to great variety, or else there are several allied species. The typical shell has the spire elongated, pointed, and the whorls flattened, with coarse, longitudinal folds.

Others are surrounded by numerous raised lines, and are nearly destitute of folds.

A variety from Lake George (Oregon) must be very corpulent. It is much decollated, and is light and thin. Whorls convex; aperture rounded-ovate; lip very flexuous, having a sinus posteriorly, and a very deep one at the point of the columella; colour pale olive-green.

Even the little *M. siliqua*, may be only a starved specimen of the Nisqually variety. All have a varix half a volution from the mouth.

Figure 165, specimen from Lake George, viewed by the aperture.

CERITHIUM (POTAMIS) SACRATUM (*Gould*).

Testa rudis, elongata, badia et fasciâ luteâ cincta: spira turrita, anfractibus ad decem convexis, vix angulatis, et liris obsoletis cinctis, supernis plicatis, ultimo globoso, abnormali, varice crasso munito; suturâ profundâ, luteâ: apertura rotundata, anticè effusa, haud emarginata; labro everso, polito, piceo: operculum multispirale.

Cerithium (Potamis) *sacratum*, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 118. Expedition Shells, 60.

SHELL rather thin, turreted, of a dark chestnut or umber colour, with a faint orange band around the middle of each whorl. Whorls ten or more, convex, somewhat angular, slightly plaited near the tip, everywhere roughened by the stages of growth, a few indistinct, raised lines surrounding them; sutural region deeply impressed, and of a pale yellow colour; the last whorl is rather globular, disproportionately large, and having a very large varix, or rather false aperture to the left. Aperture moderately oblique, effuse at the base of the columella, but not notched; outer lip everted, advancing, simple, of a deep chestnut or pitch colour. Operculum circular, horny, multispiral.

Length an inch and a half; breadth five-eighths of an inch.

Inhabits Sacramento River, California.

Allied to *C. varicosum*, Sowb. The surface, though not smooth, is destitute of longitudinal ribs, except near the tip: it has also a pale sutural region and a less marked canal. *C. Hegewischii*, Pfeiffer, is

another shell of the same general character, but varies from this in the varices and sculpture.

Figures 166, 166 *a*, two views of the shell.

CERITHIUM SORDIDULUM (*Gould*).

Testa elongata, rubiginoso-albida, costellis numerosis et filis volventibus alternatim majoribus reticulata: spira turrita, acuminata, anfractibus undecim planulatis, ultimo varicoso, granuloso; suturâ profundâ: apertura ampla, ovato-rotundata; labro crenulato, extus incrassato, rufo-tincto; rostro attenuato, valdè recurvo; fauce albâ.

Cerithium sordidulum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 119. May 1849. Expedition Shells, 61.

SHELL slender, elongated, and acutely pointed; white, tinged with rusty. Whorls eleven, rather flat, having on each about six, alternately larger, revolving threads, and numerous (fifteen on the last whorl but one), delicate, sharp, equal, regularly disposed ribs, forming, where they intersect the larger revolving threads, brilliant granules; on the last whorl, opposite the aperture, is a varix, and below this the ribs are wanting; the revolving threads become finely beaded, and around the canal simple. The suture is deep, and the whorl above it shelves somewhat over it. Canal elongated, and strongly recurved. Aperture large, rounded; the lip sharp and very finely crenulated; externally fortified by a strong varix; callus of the columella erect, and the whole edge of the aperture delicately tipped with rufous. Interior smooth and white.

Length seven-tenths of an inch; breadth one-fourth of an inch.

Figures 170, 170 *a*, two views of the shell, enlarged; 170 *b*, natural size.

Closely allied in size, form, sculpture, and aperture to *C. muscarum*, Say, but distinguished from all others by its delicately tinged peristome. In its general structure, especially in the development of the

last whorl, this may be compared with *C. columna*, Sowb., but it differs entirely in sculpture; its beak is very much shorter, and it is very much smaller.

CERITHIUM INVAGINATUM (*Gould*).

Testa elongato-turrita, sordidè alba, ad apicem et interdum ad rostrum rufescens, filis tenuibus cincta: spira anfractibus decem ad duodecim angulato-convexis, supernè tabulatis, infernè constrictis, nodoso-plicatis et concinnè lamelloso-rugosis, ultimo carinato: apertura subquadrata, alba; rostro gracili, recurvato.

Cerithium invaginatum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 120. May 1849. Expedition Shells, 61.

SHELL turreted, of a dead, dingy white colour, dusky brown at tip and usually at the beak, girded with several fine, unequal, raised threads; whorls ten to twelve, angularly convex, bearing about eight tubercular folds, shouldered posteriorly, and most delicately barred with lamellar wrinkles; anteriorly deeply girt in, and channeled at the suture; the basal whorl has also a keel-like ridge, revolving just behind the beak, giving the whorl a triangular outline. Aperture rendered somewhat quadrangular by the termination of the ridge; posterior canal quite closed in; columella moderately arcuated and slightly clothed with callus; canal long and delicate, recurved and inclined to the left.

Length seven-eighths of an inch; breadth one-fourth of an inch.

Inhabits the Feejee Islands.

This is a very peculiar species, quite different from any hitherto described. The tuberoso whorls, rendered unusually independent by the deep constriction at the suture, causing them to appear, when viewed from above, as if thrust into each other, and the very delicate wrinkling of their superior portion renders the diagnosis clear.

Figures 169, 169 *a*, two views of the shell; 169 *b*, details of sculpture.

CERITHIUM ADUNCUM (*Gould*).

Testa solida, distorta, acuminato-conica, leviuscula, filis tenuibus cincta, luteo-cinerea, fusco-tincta: spira acuminata, anfractibus novem planis, suturâ vix discretis, ultimo gibboso, valdè deflecto: apertura angusta, callosa, in canalem adscendentem producta; labro crasso, simplici: fauce lividâ.

Cerithium aduncum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 119. May 1849. Expedition Shells, 61.

SHELL of medium size, solid, acutely conical, rounded at base, having a sort of flexure of the last whorl upon the others, so that the ventral face is rectilinear, while the dorsal aspect is strongly gibbous. The surface is nearly smooth and somewhat polished, having only delicate, crowded, raised, revolving threads; colour yellowish or ashy, tinted with dusky, somewhat arranged in dotted zones. Whorls nine, the upper ones nearly flat, scarcely distinguished by the suture, the last semi-globose, slightly undulated near the suture, and bearing a fold-like varix. Aperture small, with a prolonged, posterior canal and copious callus; siphonal notch small and contracted; outer lip thick, rounded, smooth, white, finely crenulated within; fauces livid.

Length one inch; breadth two-fifths of an inch.

Inhabits Mindanao, Philippine Islands.

This smooth, solid, dusky species is plainly marked by its peculiarly distorted form, the last whorl being so flexed upon the others that its ventral outline is straight, while the dorsal outline is remarkably arched.

It is allied in colour and size to *C. ocellatum*, Lam.

Figures 167, 167 *a*, 167 *b*, three views of the shell.

CERITHIUM IRRORATUM (Gould).

Testa ovato-conica, transversim striolata, fusco-nigricans, punctis elongatis cinereis irrorata: spira conica, anfractibus septem planulatis, longitudinaliter undulatis, ultimo dimidiam testæ superante; suturâ obsoletâ: apertura rotundato-elliptica; labro declivi; canali brevissimo; fauce lividâ, albo-fasciatâ.

Cerithium irroratum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 119. May 1849. Expedition Shells, 61.

SHELL of medium size, rather solid, short ovate-conic, surrounded by numerous fine striæ; colour dusky, sprinkled with numerous minute, elongated, whitish dots, arranged in the interstices of the striæ. Spire short, conical, composed of seven or eight whorls, on which are about eight oblique undulations, and so continuous that the suture is barely perceptible: the last whorl is more than half the length of the shell, rounded at base. Aperture rounded oval, nearly destitute of a posterior canal, and with a mere basal notch in place of a rostrum; columella arcuated, whitish, with a posterior callus.

Length three-fourths of an inch; breadth four-fifths of an inch.

Generally resembling *C. ocellatum*, Lam., which has a median tuberculated angle on each whorl, and an excavated sutural region, while this has a regularly curved outline and folded surface. The pale spots are less numerous, and the proportions of the aperture are different.

Figures 168, 168 *a*, two views of the shell.

CERITHIUM CÆLATUM (Couthouy).

Testa subulato-turrita, dilutè rufa: spira anfractibus ad tredecim vix convexis, longitudinaliter crebrè sulcatis, et lineis duabus impressis cinctis, ultimo anfractu ad basim inornato; suturâ impressâ: apertura rotundata; columellâ arcuatâ, rostro brevissimo.

Cerithium cælatum (Couthouy MS.), GOULD; Proceed. Boston Soc. Nat. Hist., iii. 123. May 1849. Expedition Shells, 62.

ANIMAL small, yellowish flesh-colour, ochreous above, speckled with black dots; head short, mouth with a short, vertically compressed proboscis; tentacles subulate, a little compressed vertically; eyes lateral, near the tips, without pedicles; locomotive disk elongated oval, truncate in front, the angles not dilated, with a longitudinal groove on the median line. Operculum oval, thin, semitransparent, yellow, unispiral, apex subterminal.

SHELL subulate, or elongated-conical; colour purplish-brown; whorls thirteen or fourteen, deeply impressed with broad, longitudinal sulci, with intervening folds of the same width, and decussated by two fine revolving lines, deeply indented as they cross the sulci, thus cutting each whorl into three bands of gemmules.

On the base of the last whorl are only incremental lines. The suture is very deeply impressed, and has a delicate callus behind it, and the base is surrounded by two impressed striæ, the marginal one strongest. Aperture nearly circular; columella strongly arcuated; lip acute; canal short, inclining abruptly to the left and slightly ascendant. [J. P. C.]

Length three-fourths of an inch; breadth one-fifth of an inch.

Obtained at Orange Harbour, Tierra del Fuego. *Couthouy*.

This species belongs to the same group as *C. turritella*, which it resembles; but in its delicate form it still more strongly resembles *C. sardoum*, Cantr.

Figure 174, shell, with the animal, as in motion, enlarged; 174 *a*, 174 *b*, front and basal view of the animal, enlarged; 174 *c*, the shell, natural size; 174 *d*, operculum, enlarged.

CERITHIUM FILOSUM (*Gould*).

Testa parva, elongato-turrita: spira anfractibus ad octo planulatis,

sulcis et liris alternantibus æqualibus ad quatuor cinctis, coloribus cinereis et pallidè rufis partitis; suturâ impressâ: apertura parva, semi-elliptica, anticè emarginata; columellâ vix arcuatâ; labro acuto.

Cerithium filosum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 120. May 1849. Expedition Shells, 62.

SHELL small, turritella-shaped, pale ash-coloured on the posterior, and pale brown on the anterior half of the whorls: these are about eight in number, flat, with a well-marked suture, each one of them sculptured with about four alternating ridges and grooves, of about equal width, the grooves regularly concave, the ridges sometimes subdivided by a very delicate groove; on the basal whorl are about ten grooves, growing gradually less conspicuous. Aperture small, less than one-fourth the length of the shell, semi-elliptical, with a mere basal emargination instead of a canal; lip thin and simple; columella slightly arcuated; interior with ridges corresponding to the external grooves.

Length five-eighths of an inch; breadth one-fifth of an inch.

Inhabits Puget Sound, Oregon.

Only a single specimen of this turritella-like *Cerithium* has been examined. It is of the same type as *C. cælatum*, and is well-characterized by its simple revolving lines and grooves, and its coloration.

Figures 175, 175 *a*, two views of the shell, enlarged; 175 *b*, details of sculpture; 175 *c*, natural size.

CERITHIUM PUSILLUM (*Gould*).

Testa minuta, fulva, turrita, varicosa, longitudinaliter undata, undis ad decem, propè basim evanescentibus: spira acuminata, anfractibus octo convexis, filis tenuibus granulosis quatuor cinctis, anfractu ultimo multicincto: apertura lata, ovata, obliqua; rostro brevissimo; labro varicoso; columellâ arcuatâ.

Cerithium pusillum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 120. May 1849. Expedition Shells, 62.

SHELL minute, fawn-coloured or pale ferruginous, elongated, acutely turreted, having about ten undulations on the upper whorls, which end on the middle of the last whorl; on each whorl are four delicate, raised, beaded, revolving lines, and on the anterior part of the basal whorl several other finer threads, some of which are usually beaded. There are several well-marked varices, the outer lip being fortified with a large one. Whorls about eight, convex, somewhat overhanging each other. Aperture broad ovate, oblique; rostral canal very short; columella arched, with a delicate coat of callus thickened at the posterior angle; suture deep.

Length one-fifth of an inch; breadth one-twelfth of an inch.

Inhabits the Sandwich Islands.

A little shell, about the size and with many of the characters of *C. Emersonii*. It also resembles *C. ferrugineum*, Say, but is much smaller.

Figure 172, front view of the shell, enlarged; 172 *a*, natural size; 172 *b*, details of sculpture.

CERITHIUM EGENUM (*Gould*).

Testa minuta, lanceolata, albida, ad basim maculis parvis fuscis notata: spira acuminata, anfractibus ad decem convexiusculis, filis ad quinque cinctis, quorum centrali et suturali majoribus, anfractu ultimo utrinque varicoso: apertura rotundato-ovalis; rostro brevissimo; columellâ posticè callosâ.

Cerithium egenum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 120. May 1849. Expedition Shells, 62.

SHELL minute, dingy white, with a few minute, dusky blotches about the base, elongated, turreted, acuminate at apex; surface dead, indefinitely sculptured with about five indistinct, unequal, sharp, revolving lines, of which the sutural and central ones are largest. Whorls about ten, scarcely convex; a well-marked varix on the left side of the basal whorl; whorls rendered a little angular by the large

central thread. Aperture rounded oval, canal very short, callus scanty on the columella, with a boss posteriorly.

Length three-tenths of an inch; breadth one-eighth of an inch.

Obtained at Wilson's Island. *Couthouy*.

The characters of this little shell are somewhat negative, but on the whole it may be distinguished by its sharp, revolving lines having a tendency to granulation, without longitudinal folds; the little blotches in the region of the rostrum seem to be constant. It is a little like *C. lacteum*, Kiener, but much smaller.

Figure 171, front of the shell, enlarged; 171 *a*, natural size; 171 *b*, details of sculpture.

CERITHIUM JANTHINUM (*Gould*).

Testa parva, tenuis, ovato-lanceolata, violacescens sed labro, suturâ et varicibus albis: spira acuminata, anfractibus ad decem trivariosis filis tenuibus ad octo cinctis, quorum mediano majori et granoso ad anfractus apicales: apertura ovato-rotundata; rostro brevissimo; columellâ vix callosâ.

Cerithium janthinum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 121. May 1849. Expedition Shells, 62.

SHELL small, rather thin, elongated, ovate-lanceolate, of a pale violet colour, with the lip, sutural zone, and varices white; tip acuminate and of a deeper colour; surface sculptured with fine, raised, revolving lines, of which there are about eight or nine on each whorl; spire of about ten whorls, convex, those of the apex rendered angulated by the central thread being raised and somewhat nodular. There are three prominent varices on each whorl. Aperture rounded-ovate, canal very short; callus on the columella very sparing.

Length three-eighths of an inch; breadth three-twentieths of an inch.

Found at the island of Clermont Tonnerre. *Couthouy*.

If this be not the young of some other species, which I somewhat suspect, it is very well marked by its colour alone; the contrasting of the white and violet, and its numerous ribs being beautifully displayed. It is larger than *C. egenum*.

Figure 173, front view of the shell, enlarged; 173 *a*, natural size; 173 *b*, details of sculpture.

GENUS PELEX.—GOULD.

Testa parva, navicelloidea, tenuis; vertice terminali, obliquo: apertura ampla, ovalis: cavositas septo angusto posticali horizontali partita; septi margine ab latere sinistro disjuncto, et in processum gracilem contortum producto.

This curious shell resembles a minute *Navicella* or *Crepidula*, for which it was for a long time mistaken, until the peculiarity of the diaphragm was noticed. The detachment of its edge from the side of the shell forms a fissure or sinus, rounded at its base, directed towards the apex of the shell, and seems designed for the safe passage of some important organ. Nothing is known of the animal, except that it inhabits fresh water. Its affinities would seem to be with *Navicella* and *Neritina*, with which it is therefore associated. The new genus *Gundlachia*, of Dr. Pfeiffer, established upon a West India shell, has very similar characters; but the septum occupies a very much larger proportion of the shell, and the peculiar conformation at its left extremity does not exist or was overlooked. Our shell comes from New Zealand.

PELEX LATERALIS (*Gould*).

Testa parva, crepiduloidea, tenuis, vix striata, obliquè ovata, elevata; vertice sublaterali prominulo, acuto, incurvo; epidermide olivaceo: apertura ovalis, intus olivacea; peritremate posticè expanso: septum album, concavum, ad trientem altitudinis situm; margine acuto; aculeo lateraliter compresso.

SHELL small, thin, crepiduloid, obliquely ovate, elevated, the vertex acute, projecting a little beyond the outline of the shell, its point incurved and resting on the shell a little obliquely at the left, but not quite attaining the margin of the aperture; surface feebly striated by a few irregular lines of growth, and covered by a dusky-olive epidermis. Aperture oval, the margin posteriorly expanded; within olivaceous; diaphragm white, concave, at about one-third the depth of the cavity; the free edge acute, and its terminal spur contorted, so as to present its broad surface laterally.

Length three-tenths of an inch; breadth one-fifth of an inch; height one-eighth of an inch.

Found in fresh-water streams near Wangarara, and at the falls of Waitanga, New Zealand.

For a long time this curious little shell was regarded as a miniature form of some *Navicella*, though it was somewhat unexpected that this genus should be found in New Zealand. A closer inspection revealed its distinctive characters. In form it closely resembles *Siphonaria Lessoni*, especially the small, oblique varieties.

Figures 176, 176 *a*, 176 *b*, three views of the shell, enlarged; 176 *c*, the septum with its spiculum and canal, enlarged; 176 *d*, the shell, natural size.

GENUS NAVICELLA.

The *Navicellæ* were observed to prefer quiet little pools formed by eddies, adhering to the stones at some distance below the surface. They are nearly sedentary, and appear to shift their position little oftener than the *Patellæ*; while the *Neritinæ* delight in the rapid and turbulent portions of the stream, and occasionally emerge altogether from the water, for a considerable time.

Very numerous specimens of this genus were collected, though it may be doubted if a single well-characterized new species was obtained. A careful study of series of specimens taken from the same pool, has tended to show how very variable the characters of these

shells are, and of how little value the marks usually depended upon as specific really are. The following are among some of the conclusions deduced.

1. That the general and the ornamental colours of the same species may vary indefinitely. The markings will sometimes be in flamules, in coarse or fine zigzag lines, in triangular blotches, &c.

2. The presence of a tongue (languette) to the columella is accidental and not of specific value, as among a number of specimens unequivocally of the same species, some will possess it and others not. It is probably the result of advanced age.

3. The colouring about the septum, especially the presence of dark blotches, is accidental, and occurs in all species.

4. The width or area of the muscular impression varies very much in shells which, beyond all question, are the same, and therefore cannot be taken as a specific character.

One of the species obtained is doubtless *N. Suffreni*, Recluz; and exhibits wide variations in size. Some of them have a gummy exterior, which causes them to seem granulated or wrinkled. The most important character of the species is, the very obliquely shelving position of the septum, and, *generally*, its very broad, muscular impression.

Another equally common species, which I should not hesitate to call *N. Freycineti*, Recluz, were it not that it is said to be a Macassar shell, has a very simple and uniform colouring, with a very narrow, nearly horizontal septum, of a pale yellow colour; the muscular impression is, *generally*, quite narrow.

A third species, from Tahiti, may be different still. It is more tectiform, especially near the spire, dark coloured and shining. It may be *N. Entrecasteauxi*, Recluz.

NAVICELLA FREYCINETI (?), (RECLUZ), Rev. Zool., 1842, p. 120.

The ANIMAL of the shell supposed to be the above species is small, ochreous above, with short, olivaceous, interrupted lines; beneath

lemon-yellow, or tinted bronze at the centre; head short and broad, lobed in front; tentacles very short, scarcely longer than the head, bluish; eye pedicles about one-third the length of the tentacles, large, yellow; mantle dirty green.

Figures 177, 177 *a*, lateral and basal view of the animal, with the shell.

NAVICELLA PORCELLANA (CHEMNITZ), *N. elliptica*, LAMARCK, DESHAYES, RECLUZ, &c.

ANIMAL above slaty, with lilac tints, slightly lineated with dusky along the sides; foot grayish, with lilac reflections; tentacles long and tapering, olivaceous.

Figures 178, 178 *a*, lateral and basal views of the animal, with the shell.

NERITINA CHOLERICA.

Testa obliquè semiglobulosa, solidula, leviter striata, castaneo-fusca, subtus interdum lineolis flexuosis nigris picta: spira vix exserta, ultimo anfractu recurrente ferè involuta: apertura obliquè semicircularis, magna, posticè canaliculata; labro flavo; labio planulato extrinsecus sanguineo tincto; columellâ albâ, valdè sinuatâ, denticulatâ. Operculum tenue, lividum, sulco divisum, granulatum, ad apicem flavidum.

Neritina cholericæ, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 237. July 1847. Expedition Shells, 47.

ANIMAL with a large cream-coloured foot, shaded olive beneath; mantle dark olive; head short and broad, above pale yellow, concentrically striated with coarse, interrupted, dark olive lines; tentacles very slender; eye pedicles stout, long, whitish.

SHELL rather large, semi-globose, a little oblique, with pretty dis-

tinged lines of growth and traces of revolving lines covered by a thick epidermis, which, in old specimens, is a pitchy black, and in young, dark chestnut-coloured, when a few delicate, broken, flexuous, dusky lines may be seen on the ventral face. Spire eroded, scarcely prominent, mostly enveloped by the recurrent outer whorl. Aperture large, semicircular, a little oblique, slightly channeled posteriorly; outer lip of a pale golden or honey-yellow colour, somewhat livid in the throat; inner lip large, flat, tinged chlorine-green, and in old specimens, having a reddish-brown blotch at its outer anterior margin; columellar edge white, deeply sinuate, with a large tooth at the upper third, and another near its lower termination, forming three sinuses, the middle one distinctly denticulate. Operculum small and thin, almost horny, externally slate-coloured, white at the anterior tip, divided longitudinally by a furrow; internally marbled with whitish and slate-colour.

Diameter three-fourths of an inch.

Inhabits the Feejee Islands. *Drayton*.

Allied to the dark varieties of *M. cornea*, but distinct by its involved and girded spire, like *N. Bruquieri*, and also, by its very sinuous and strongly-toothed pillar lip. It has a channel towards the spire much like *N. canalis*, whose colour and marking of the ventral face it also resembles.

Figures 187, 187 *a*, two views of the shell; 187 *b*, the operculum.

NERITINA PORCATA (*Gould*).

Testa obliqua, sub-hemispherica, solidiuscula, fusco-rubricans, maculis parvis nigris interdum tessellata, longitudinaliter striata et rugis conspicuis ordinatis sub-imbricatis porcata: spira vix tumida, anfractu ultimo penitus involuta; apertura parva, lunata: labro callo aurantiaco intus munito; labio plano, lato, sanguineo; columellâ arcuatâ, denticulatâ.

Neritina porcata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 237. July 1847. Expedition Shells, 47.

SHELL nearly hemispherical, a little oblique, not very solid, of a dark rusty-brown colour, and often faintly chequered with small, dusky spots, arranged somewhat in quincunx. The surface is sculptured with coarse, sharp, well-raised, longitudinal folds, having a tendency to overlay each other, and in addition to these may be seen the striæ of growth. The spire produces a small, slightly raised tubercle, which is wholly enveloped in the last whorl; suture ragged. Aperture small, semicircular, the outer lip strengthened within by an orange-coloured callus; throat bluish; the inner lip presents a broad, flat surface, as large as the aperture, of a cinnabar-red; the columellar edge is sharp, slightly arched, its whole length slightly denticulated.

Diameter half an inch; axis seven-tenths of an inch.

Probably from the Samoa Islands.

Like *N. Brugueri* and *canalis*, it has the spire wholly involved in the last whorl. The former has a somewhat elevated spire, a larger aperture, and a smooth and silky, instead of a ridged surface. The latter is distinct by the canal which winds along the suture.

Figures 191, 191 *a*, two views of the shell.

NERITINA CHRYSOCOLLA (*Gould*).

Testa solida, obliquè conico-globosa, coracina, lineis exilibus obliquis flavidis flexuosis picta: spira elevata, erosa; anfractibus duobus vel tribus ventricosis, infra suturam aliquid constrictis: apertura obliquè semi-elliptica; labro cæruleo, viridi-limbato; labio convexo, luteo-virente; columellâ sinuatâ, denticulatâ: operculum osseum, salmonaceum, costâ bisectum.

Neritina chrysocolla, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 237. July 1847. Expedition Shells, 48.

SHELL obliquely conic globose, solid, smooth, greenish-black, painted with delicate, oblique, zigzag, yellow lines: spire elevated, eroded at tip, but displaying two or three convex whorls, the large one sometimes a little constricted near the suture. Aperture obliquely

semi-oval, the outer lip edged with indigo-blue, and bright pea-green within; the inner lip is convex, pale yellowish-green; the columellar edge deeply sinuated and minutely denticulated. The operculum pale salmon-coloured, thick and bony, having a strong rib, which is most prominent inside, bisecting it; convex edge brown; columellar edge gibbous.

Axis three-fourths of an inch; diameter three-fifths of an inch.

Inhabits Upolu, Samoa Islands.

Of the same group as *N. communis*, *lugubris*, and *Turtoni*, but distinct by its green, blue-edged outer lip, and yellowish-green pillar lip, as well as by its very delicate zigzag lines, scarcely seen except on the ventral face.

Figures 188, 188 *a*, two views of the shell.

NERITINA AMÆNA (*Gould*).

Testa parva, ovato-triangularis, posticè constricta, striis incrementalibus ordinatis benè insculpta, coloribus nigris, rubris, flavidis plerumque fasciatim dispositis, et maculis quadratis albis nigro-umbratis tessellatim dispositis, picta: spira planulata, erosa, anfractibus duobus vel tribus: apertura rotundato-elliptica, flavo-viridis; labro angusto, plano; columellâ valdè arcuatâ, decem denticulatâ. Operculum viridulum, inornatum.

Neritina amæna, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 238. July 1847. Expedition Shells, 49.

SHELL small, of a triangular-ovate, gibbous form, shining, delicately marked with large, regularly disposed lines of growth, beautifully ornamented with various colours; generally, the ground is of a more or less rose-red tint, often alternating with black bands, more or less distinct, and the whole is thickly spotted with small quadrangular white spots, which cast long, conical, black shadows toward the aperture. Spire not elevated, but even a little depressed, eroded, of two or three whorls; suture distinct. Aperture rather long, rounded-ovate,

of a yellowish-green colour, narrowly edged with blue; columella somewhat prolonged at base; edge unusually arched and provided with about ten sharp denticulations; labium narrow, flat. Operculum pale green, inner edge strongly sinuate, rugose, inflexed; terminal apophysis small, erect, cylindrical; inner apophysis minute, being the termination of a sharp rib, revolving from the apex.

Axis three-sixteenths of an inch; diameter one-fourth of an inch.

This might be regarded as the young of *N. polita* or *N. Rumphii*. It is striated like them, but it differs in the colour of its aperture, and in its opercle; and the shadowed white spots are constant and peculiar.

Figures 192, 192 *a*, two views of the shell.

NERITINA SIDEREA (*Gould*).

Testa parva, ovata-globosa, polita, nitida, nigra, punctis sparsis albis notata: spira prominula, erosa; anfractibus duobus vel tribus; suturâ marginatâ: apertura semicircularis, intus cærulescens; labio plano, angusto, luteo; columellâ acutâ, vix denticulatâ. Operculum fuscum.

Neritina siderea, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 238. July 1847. Expedition Shells, 48.

A small, polished, shining, jet black shell, irregularly sprinkled with minute white points. Its form is globular-ovate, with the spire considerably elevated, composed of two or three whorls eroded at tip, and with a marginal stricture just in front of the suture. The aperture is nearly semicircular, the inner lip rather small, plane or somewhat excavated, the columellar edge nearly straight, very sharp and very slightly denticulated, of a pale wax-yellow colour. The outer lip is sharp, and the throat slate-coloured. The operculum is of a still darker slate-colour.

Diameter one-fourth of an inch.

Obtained at the east end of the island of Upolu, Samoa Islands.

About the size of *N. bætica*, but more globose and solid; the inner lip is less extended, and yellow instead of bluish, and it also has the white specks by which alone it may be recognised. In *N. bætica* the opercle is flesh-coloured.

Figures 190, 190 *a*, two views of the shell.

NERITINA CANALIS (SOWERBY), Tankerville Catalogue; and Conch. Illustr., f. 22. LAMARCK; An. sans Vert., viii. 584.

ANIMAL very dark purple above, mottled with a few small paler spots, a series of which extends along each side of the head; head broad, sinuate in front, beneath reddish-violet, lips flesh-coloured; tentacles long and slender, annulated beneath with black; eye pedicles short, whitish; mantle very dark violet; disk of the foot pale reddish.

Figure 182, animal seen laterally, and 182 *a*, from beneath.

NERITINA GRANOSA (SOWERBY), Conch. Illustr., 6. DESHAYES in LAMARCK, An. sans Vert., viii. 583.

ANIMAL large; disk of the foot cream-coloured; head short, broader than the foot, crescentic, grass-green radiated and margined with white; lips paler; mantle very much developed, far surpassing the foot, scalloped at the edges, and transversely lineate with dusky, so as to appear somewhat convoluted; tentacles long and slender, dark, with a pale line underneath; eye pedicles very robust, pale beneath.

Figure 179, the animal as seen from beneath.

NERITINA TAITENSIS (SOULEYET), Voy. de la Bonite.

ANIMAL as seen beneath, grayish-olive; mantle dark purplish; head rose-red, yellowish at the lips; tentacles short, olivaceous; eye pedicles large, cylindrical; mantle dark purplish.

The shell to which this animal belongs is evidently the same as

that represented by Souleyet. He gives only the upper view of the animal, and we have here the lower view.

Figure 181, the animal seen from beneath.

NERITINA LAMARCKII (DESHAYES), in Lam. An. sans Vert., viii. 578. REEVE; Conch. Syst., pl. 200, f. 17. *Neritina auriculata*, SOWERBY; Conch. Illustr., f. 17.

ANIMAL small compared with the shell; mantle greenish, mottled with dark bluish-green, and tessellated at the margin with a series of small spots; head small, cream-coloured, mottled with minute bluish-green spots, beneath sky-blue; lips cream-coloured; tentacles slaty-blue, long and slender, not annulated; eye pedicles of the same colour, pale at the eyes; mantle greenish, mottled with dark bluish-green.

The shells of the two last species, the one from the Society Islands and the other from the Sandwich Islands, are scarcely to be distinguished, while the animals inhabiting them are evidently quite different.

The only noticeable differences in the shells are, that the former is smaller, the auricles less developed, the form more convex, and the interior colour is nearly white, instead of the drab or pale olive of the Sandwich Island species.

Figure 180, the foot of the animal.

NERITINA NUTTALLI (RECLUZ), Revue Zool. Soc. Cuv., 1840, p. 276.

ANIMAL with the foot very small, pale olivaceous; head the same, broader than the foot, crescentic; lip yellow. Mantle with an undulate margin, dark slaty-blue, with transverse yellow lines or furrows at the margin, giving it a convoluted appearance. Tentacles very short, scarcely longer than the head, pale beneath; eye pedicles very short and stout.

This appears to be the same shell as that figured in the Voyage de la

Bonite, pl. 35, f. 43, though the animal is there given as plain blue-black above.

NERITINA GAGATES (DESHAYES), *Encyc. Meth. Vers.*, iii. 624. LAMARCK; *Anim. sans Vert.*, viii. 570. SOWERBY; *Conch. Ill.*, f. 29.

ANIMAL lemon-coloured above, beautifully lineate, with four or five alternate lines of yellow and dusky; foot large, slate-coloured, dotted at the margin; mantle slate-coloured; tentacles long, eye pedicles pale.

Figure 183, shell, with the animal, as in motion.

NERITINA UNDATA (DESHAYES), in LAMARCK, *An. sans Vert.*, viii. 594. *Clithon undatus*, LESSON; *Voy. de la Coq.*, ii. pl. 13, f. 13. *Neritina spinosa*, SOWERBY; *Conch. Ill.*, f. 9.

ANIMAL large, yellowish-olive above, margined with a dark line and a submarginal fringe of short, crowded, black lines perpendicular to the margin; disk of the foot slaty-olive; head paler, orange at the lips; tentacles long, dark-olive; eye pedicles well developed, white.

Figure 193, shell, with the animal, as in motion.

NERITINA CORNEA (LIN.), *N. ampullaria*, LESSON; *Voy. de la Coq.*, ii. pl. 16, f. 1. *N. zebra*, and *N. dubia*, CHEM., &c.

ANIMAL large, above mottled with green, black, yellow, and fawn-colour in broken lines; beneath cream-coloured; mouth green, lips flesh-coloured; mantle fawn-coloured; tentacles long and stout, sea-green annulated with black; eyes black, on short, broad pedicles.

This very large specimen of a most variable species was found at the Feejee Islands. The lip is conspicuously toothed through nearly its whole length. The columellar region is very smooth and a little concave. The posterior angle of the aperture is deeply channeled, perhaps from erosion or distortion.

Figure 184, shell with the animal, as in crawling; 184 *a*, foot beneath.

NERITINA RUGINOSA, RECLUZ, in *Revue Zool. Soc. Cuv.* 1841, p. 310.

ANIMAL pale gamboge-yellow above, with longitudinal, interrupted lines of verdigris-green; head with distinct transverse lines, and a marginal range of radiating ones; beneath lemon-yellow tinted greenish; flesh-coloured about the mouth; tentacles dark above, yellowish beneath, finely annulated.

The animal of young individuals, which seems to have been given as the typical form of the species, is of a lilac hue, quite different from the adult, and might be taken for a different species.

The character given by M. Recluz, a short, narrow, transverse rib at the base of the last whorl, "a laquelle correspond un canal oblique situé à la base de l'ouverture dont la saillie rend celle-ci anguleuse," is rather the exception than the rule, and applies only to quite young specimens. Another variety, his var. *g.* "*mutica*, ultimo basi non costato, apertura basi non canaliculata nec angulata," is quite as common as any other. In some specimens the flexuous folds do not commence till a late stage of growth, being merely parallel ridges; and there is every degree in this till the shell becomes truly granular. The aperture is usually of a leaden hue; but in some Feejee specimens the aperture, especially its outer margin, is yolk-yellow or greenish.

The locality given on the authority of M. Janelle is obviously an error. It comes from the Samoa and the Feejee Islands, and was collected in great numbers.

Figure 185, the young shell, with the animal as in motion; 185 *a*, the locomotive disk; 186, head of the animal, and 186 *a*, outline of the shell of an adult specimen.

NERITINA CAFFRA, GRAY, in Sowerby's *Conch. Ill.*, f. 51. DESHAYES in *Lam. An. sans Vert.*, viii. 586.

ANIMAL violaceous, foot beneath margined by a series of small, alternately dark and light spots; mantle bluish-black, mottled with short black lines. Head very short, regularly curved in front, margined by a dark line; body above of the same colour, marbled with white and tessellated at the margin. Tentacles very long, annulated; eye pedicles small, distinct. Opercle rusty-brown.

Inhabits Tahiti, Society Islands.

Figure 191, shell, with the animal as in motion.

NERITINA HELVOLA (GOULD); Proceed. Boston Soc. Nat. Hist., ii. 238, proves to be *Nerita Turtoni*, Recluz; Proc. Zool. Soc., 1843, p. 71. It inhabits the Feejee Islands, and seems to be abundant.

NERITA MUSIVA (Gould).

Testa modica, subsolida, transversa, ovoidea, ventricosa, fusco-cinerea, longitudinaliter crassè striata, sulcis volventibus ordinatis arata, liris interpositis planulatis, sub-granulosis, lineolis crebris albidis sectis: spira prominula; anfractibus duobus vel tribus: apertura sub-circularis, caliciformis; peristomate sub-continuo; labro edentulo, albo, sulcis obliquis fuscis tenuiter arato; labio concavo, fusco, granulis paucis notato, denticulis tribus instructo.

Nerita musiva, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 238. July 1847. Expedition Shells, 49.

SHELL small, rather solid, very oblique, almost transversely ovate, its dorsal face much elevated and rounded, of a generally gray colour, produced by a dirty black ground, tessellated by ash-coloured, minute, crowded lines, which cross the ribs, as well as by coarse lines of growth, giving a fine mosaic appearance; it has an ash-coloured band, occupying two ribs around the last whorl, and sometimes also undulating mottlings. Surface ploughed with spiral grooves, so as to form numerous flattened ribs. Spire two to three whorls, rather prominent, sub-cylindrical. Aperture large, lateral; nearly circular, the peristome nearly continuous; callus citron; right edge tessellated; within

finely grooved with somewhat oblique, long, smutty folds, edentulous; left lip concave, shining, bluish-black, with a few very fine granules at the middle; middle of the edge concave, and with three very minute teeth; fauces bright yellow.

Axis one-half of an inch; diameter five-eighths of an inch.

This unusually-shaped Nerite looks like a Stomatella, with the whorls rounded in every direction, when viewed at the back. Its general form is somewhat like *N. signata*. It is remarkable for its nearly circular, cup-shaped aperture, its shining black, finely granulated concave pillar, and its gray, minutely mosaic surface, produced by the white lines crossing its ridges.

NERITA CRASSA (*Gould*).

Testa solidissima, sub-globosa, longitrorsum striata, spiraliter sulcato-costata (costis ad triginta rotundatis), fusco-cinerea, flammulis crebris angulatis obliquis variegata: spira prominula, ad apicem lutea; anfractibus quatuor rotundatis; suturâ impressâ: apertura parva, semicircularis; labro crassissimo, anciso, crenulato, intus sulcato, posticè unidentato; labio angusto, octo-plicato, plicis anticis bisectis; columella bidentata, dente antico minimo.

SHELL globose, very solid, of a reddish ashy tint, varied with interrupted black lines on the ribs, so arranged as to form numerous, oblique, zigzag, longitudinal stripes. Spire elevated, bright yellow at tip; whorls four, on the last of which are about thirty cord-like ribs, crossed by coarse lines of increment, making the tip a little granular. Aperture rather more than half a circle; lip very thick, cut square across and not sharpened to an edge, having about twelve sulci within, and a single large tooth posteriorly; inner lip nearly plane, rather narrow, with about eight folds, the four anterior of which are bisected by a transverse groove; teeth of the columella two, of which the anterior is smallest.

Diameter one inch; axis three-fourths of an inch.

I have some hesitation in designating this shell as a new species,

for there is so little permanency to the characters of this group, that the limits of species are very uncertain. This is probably the most solid of all the Nerites. It is very much like what I suppose to be *N. Guillouana*, Recluz; but the spire is less elevated, without any shelving of the lip, with twelve or fourteen sulci instead of sixteen to nineteen, and has only one instead of two teeth at the posterior angle; the ribs are rounded and not flat. *N. undulata* has an elevated spire, a protruding and undulating lip, fifteen to eighteen sulci, and two lip-teeth; there are more rugæ on the transverse lip, which terminate in lance-shaped teeth; the striæ of growth are more delicate.

Figures 195, 195 *a*, two views of the shell.

NERITA PLICATA (LIN.), Syst. Nat., 779. LAMARCK, An. sans Vert., viii. 609.

The ANIMAL, as figured in the Voyage of the Astrolabe, pl. 65, figs. 27-30, is in general correct; but the hood is protruded in a curious manner; the colour of the foot should be paler, and should show longitudinal, undulating rugæ of a darker shade on the sides above.

NERITA ALBICILLA (LIN.), Syst. Nat., 778; LAMARCK, An. sans Vert., viii. 605; Voy. de l'Astrol., pl. 65, f. 17, 18.

The ANIMAL has the same abnormal hood as the preceding, as well as an unnatural advance of the foot; the sides are much more distinctly lineated by dark, undulating lines; it is paler yellow, tinted with sky-blue and white.

Figure 194, the animal seen from below; 194 *a*, the animal as in motion.

NERITA UNDATA (LIN.), Syst. Nat., 779; DESHAYES, in Lam. An. sans Vert., viii. 616.

ANIMAL with the foot and head bright yellow above, with undulating concentric lineations of black; tentacles short, slate-coloured; foot

beneath, cream-coloured, tinted bluish; head beneath, azure; mouth yellow.

The shell represented is about half grown, and coloured for the most part black, mottled with ash-coloured blotches, as we find in the earlier stages of the majority of specimens.

Figure 196, 196 *a*, two views of the animal, with the dark variety of the shell.

TROCHIDÆ.

No group of shells remains in a more unsatisfactory state of adjustment than that of the Trochidæ, including among others the genera Trochus, Turbo, Monodonta, Delphinula, and Littorina. Some have maintained that all these, and several more, should be held as well-characterized genera. Others, and especially M. Deshayes, after a more extended examination of the animals, and finding their organization to be essentially alike, would incorporate the first four at least, into one great genus, subdivided into sections. Swainson, Philippi, and Gray, have each proposed extensive subdivisions, all of which, however, are founded on characters of the shell alone. Still, the relations of the several members of this group remain unadjusted; and the difficulties, both as to generic and specific distinctions, seem to have been so numerous that no one has ventured to undertake the task. Conchologists have therefore passed by this field with the hope of by and by returning to it better qualified, by the exploration of less doubtful groups, to cope with the difficulties; but other fields have proved so fruitful that no one has yet arrived at this.

Deshayes indicates the true method to be adopted, when he remarks that we must scrutinize as many of the animals of these shells as possible, and ascertain if there be not some zoological characters to circumscribe genera which cannot be limited by the shell alone. As a contribution to this end, all the figures of animals of this family, made during the Expedition, are here given; and the result to which we have arrived, from a comparison of these figures, and such others as we have had access to, is, that there are zoological characters important enough, and constant enough, to justify generic subdivisions;

and to show also, that their dividing lines do not coincide with any of the artificial limits hitherto drawn from the shell alone. We are disposed to place more value on the structure of the operculum than M. Deshayes is inclined to. According to our observations, a modification of the operculum is found to be accompanied by a decided modification of the animal, much more certainly than a variation in the form of the shell is. The number or absence of the lateral cirrhi also, is a character to which we should give some weight, on the observed principle, that multiplication of parts performing the same office indicates inferiority of rank.

As no summary of the characters of the animal of the Trochidæ has been given, we have made the following abstract of them, so far as they relate to external configuration.

ANIMAL short; locomotive disk truncate anteriorly, broadly rounded posteriorly; head probosciform, without trunk; tentacles long, filiform, annulate; eye pedicles distinct, generally bearing a cartilaginous auricle at the inner base, beneath which the tentacle issues: a lateral veil passes backwards from the adhering muscle of the animal to the operculum, its margin undulated and more or less incised, and usually bearing cirrhi.

As in this work we are restricted to the consideration of individuals, rather than at liberty to enter upon more general propositions, we have arranged our species under such generic names as are commonly received.

TURBO SETOSUS (GMELIN), CHEMNITZ, Conch., v. 181, f. 1795, 1796. LAMARCK, An. sans Vert., ix. 191, &c.

ANIMAL. Head prolonged into a broad, sub-trilobate muzzle, flattened out in front, and having a duplication at its inferior margin, continued from the buccal fissure in a deep sinus terminating at the juncture of the foot and the body near the peduncle of the right eye; on the under side of this peduncle, at about one-third the distance from the base, is a small mammilliform tubercle. The foot is broadly oval with a profound sinus down the middle, so that the anterior margin is indented by it; on each side of this sinus are numerous large, transverse

rugæ; colour bright ochreous, deep sea-green above, with radiating ramifications of darker green, lighter than elsewhere at the margin. Muzzle beneath sienna-brown, above mottled with yellow. Ocular pedicles with a whitish triangular appendage at their inner base, the margin incised so as to form five small lobes; they seem capable of moderate dilatation and contraction. Tentacles long and slender, dark brown, annulated with faint blackish lines. From the base of the tentacles arises a lateral veil, extending nearly to the opercle, bearing on each side a single filamentary appendage. The branchiæ are very large, ensiform, double, their extremities projecting to the left beyond the mantle. Mantle projecting slightly beyond the shell, of a light umber colour. The lateral veil, or fringe, is clouded pale yellow and white, broadest anteriorly, having a fissure at its anterior third, and with its free edge finely incised.

The motions of the animal are rapid, but it is very cautious, and often remains half a day with the tentacles slightly protruded, withdrawing on the slightest disturbance. Found abundantly at Clermont Tonnerre. [J. P. C.]

Figure 198, shell, with the animal, as in motion; 198 *a*, locomotive disk; 198 *b*, head and tentacles in outline; 198 *c*, tentacle and leaflet, enlarged.

TURBO ARGYROSTOMUS (LIN.), Syst. Nat., ed. 12, 1236. DESHAYES, in LAM., An. sans Vert., ix. 188.

ANIMAL beneath ochreous; above clouded with saffron-yellow; tentacles ferruginous; auricles of the eye pedicles diamond-shaped, very numerous and delicately crenulate; head flabellate; lateral cirrhi two (?) on each side.

Figure 199, the animal as in motion; 199 *a*, the head and tentacles in outline; 199 *b*, the eye with its leaflet, enlarged.

TURBO SPARVERIUS (GMELIN), LAMARCK, An. sans Vert., ix. 220. CHEMN., Conch., v. 204, pl. 181, f. 1798.

ANIMAL having the locomotive disk dark ochreous, greenish along the middle; cervical veil and head paler; body above mottled with ochreous and mahogany-brown; there is a transverse band across the base of the tentacles, and a sub-marginal one on the lip; the head is short and broad; lateral cirrhi one on each side. Operculum greenish.

Figure 200, the animal, as in motion.

TURBO PETHOLATUS (LIN.), Syst. Nat., 12 ed. 1233; LAMARCK, An. sans Vert., ix. 192.

ANIMAL with the locomotive disk short, escutcheon-shaped, dark ochreous; above burnt-sienna colour, somewhat reticulate; cervical veil the same above and below; tentacles remarkably long; eye pedicles auriculate; a single cirrhus on each side.

Figure 201, shell, with the animal, as in motion; 201 *a*, the locomotive disk.

TROCHUS NIGER (GRAY), in Wood's Index, Suppl. (1828); Zoology of Beechey's Voy., pl. 36, f. 1.

ANIMAL much like that of *T. ater*. Body black, dotted with brown; tentacles long and slender, slate-coloured, annulated with black; mantle slightly notched at the margin, to correspond with the grooves of the shell. Foot broad, oblong, cream-coloured, with a faint anterior marginal fissure; lateral fringe very narrow, bearing four filaments on each side. Operculum calcareous, convex and granular externally, plane and covered by a horny epidermis on its adhering surface. Found both at Valparaiso and Callao. [J. P. C.]

Figure 212, shell, with the animal, as in motion; 212 *a*, locomotive disk.

TURBO CONFRAGOSUS (*Gould*).

Testa solida, albida, pyramidata, rudis, rugosa; rugis parvis, obtusis,

ad peripheriam et ad angulum anfractuum interdum in spinis compressis prominulis productis: spira anfractibus ad sex, angulatis, superne declivibus, ultimo ad peripheriam acuto; suturâ callosâ: basis planulata, liris squamosis concentricis inequalibus ad octo cincta: apertura circularis; labro acuto, perobliquo: columellâ curtâ antice dentatâ; fauce margaritaceâ.

Turbo confragosus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 89. March 1849. Expedition Shells, 54.

ANIMAL colourless. Head broad, mouth inferior, tentacles long and subulate, eyes on short basal pedicles; foot oblong oval, centrally furrowed; winglike appendages of the mantle anteriorly, from the edge of which, midway, arise two short, approximate cirrhi each side; a spot at the inner base of each tentacle, and a submarginal band surrounding the head and foot composed of short, blue-black lines; tentacles annulated with the same.

SHELL low conical, somewhat turreted, solid, pale cinereous, surface rugose, the wrinkles small, rounded, irregular, oblique, slightly squamous here and there; whorls about six, somewhat shouldered above, declivous at the upper part, and having two angles towards the base, on which about every third rib is prolonged into a folded spine, quite small on the upper ridge, but distinct on the lower one, which constitutes the periphery of the base, and thus becomes stellate; suture callosous; base plane, encircled with about eight distinct, approximate, squamose ridges, generally alternately larger and smaller; aperture circular, lip sharp, very oblique; columella short, rounded, at the base of which is a distinct white tooth, lying obliquely across it; interior silvery.

Diameter an inch and an eighth; axis seven-eighths of an inch.

Found at Dean's Island, Paumotu Group. *Couthouy*.

This species has the low conical form and bony aspect of the stellate species found in the West Indies. I know of no other similar one from the Pacific. Its wrinkled surface, polygonal whorls, and the squamous basal ridges, mark it.

Figure 202, animal, with the shell, as in motion; 202 *a*, disk of the foot; 202 *b*, front view of the shell.

TURBO SIRIUS (*Gould*).

Testa parva, imperforata, pyramidata, dilutè beryllina, leviter corrugata: spira anfractibus quatuor conicis, infra obliquè plicatis, ad peripheriam acutis et spinis compressis ad octodecim armatis: basis planulata, stellaris, liris concentricis muricatis ad quinque insculptis; regione columellari arcuatâ, lævigatâ; labro perobliquo.

Turbo sirius, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 90. March 1849. Expedition Shells, 55.

SHELL small, low pyramidal, of a pale emerald-green colour when cleansed, of about four conical whorls, acutely compressed at their bases, having about ten oblique ridges on the lower half of the whorl, each of which is produced into a delicate, triangular tooth beyond the periphery; and these dentations, with an intervening one of equal size, making in all about eighteen teeth, give the base a serrated outline, extending up all the whorls; the surface is moreover faintly corrugated by still more oblique folds; base nearly flat, imperforate (the columellar region smooth, rounded, arcuate), having about five delicate and distantly muricated, unequal rib-striæ; aperture circular; lip horizontal at base, forming a very acute angle with the ascending portion, which is very oblique.

Opercle stony, smooth internally, covered with a gamboge epidermis; sutural region raised; outer surface finely crenulate at margin; surface of boss slightly indented.

Diameter half an inch; axis three-tenths of an inch.

Inhabits New Holland.

The multitude and regularity of the triangular projections of the periphery, when viewed from below, give the base a beautiful star-like form, much like *T. stellaris*.

Figure 203, profile view of the shell; 203 *a*, base of the shell; 203 *b*, sculpture of the shell, magnified; 203 *c*, 203 *d*, two sides of the operculum.

TURBO LACINIATUS (Gould).

Testa rudis, depresso-conica, cinerea roseo-tincta: spira anfractibus quatuor, irregulariter plicatis, plicis ad peripheriam acutissimis, dilatatis et in spinis elongatis compressis excurrentibus: basis convexiuscula, liris muricatis concentricis decem ad duodecim insculpta: apertura circularis; columellâ lævi, arcuatâ, roseâ; labio perobliquo: faux margaritacea.

Turbo laciniatus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 90. March 1849. Expedition Shells, 55.

SHELL small, rude, low conical, cinereous, tinged with rose-red, especially beneath; whorls about four, conical, irregularly undulated with small, unequal folds, the lower edge sharp and laciniated with a range of long, unequal, folded, compressed spines, connate at their bases; base somewhat convex, imperforate, marked with ten or twelve concentric ranges of sharply muricated striæ; aperture circular, lip very oblique; columella smooth, arcuate, rose-coloured; interior nacreous.

Opercle stony, inner surface convoluted, flat, covered with a chestnut epidermis; central boss kidney-shaped, roseate above, paler and somewhat convoluted below, minutely indented; margin excavated.

Diameter three-fourths of an inch; axis three-fifths of an inch.

Obtained at Manila.

This species is closely allied to *T. rhodostoma*, but wants the double series of spines at the periphery.

Figure 204, profile view of the shell; 204 *a*, base of the shell; 204 *b*, details of sculpture, enlarged; 204 *c*, the operculum.

TROCHUS BICRENATUS (*Gould*).

Testa pyramidata, flavescens, flammulis rufis alternis saturatioribus ornata, lineis equalibus granulosis cincta: spira anfractibus septem ad octo, penè concavis, ad peripheriam acutis et denticulis roseo-crenulatis ad quindecim munitis: basis planulata; vortice umbilicali eburnea: apertura trapezoidea; columellâ contortâ.

Trochus bicrenatus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 106. April 1849. Expedition Shells, 57.

SHELL low pyramidal, acute at apex; base and height nearly the same; base flat, pale yellowish, marked with delicate, equal, and equidistant, beaded and revolving lines; umbilical pit, like a vortex, of a smooth, ivory-white polish; whorls seven or eight, slightly excavated; basal edge acute, and furnished with about fifteen scallops; above this are three lines of beaded granules, arranged also in oblique lines, which extend in the form of slight folds to the edge of the periphery, producing by their extension three or four crenulations of a rose-tint, between each of the scallops; so that the periphery, when viewed below, appears doubly crenulated; columella sharp, contorted; aperture trapezoidal; colour flamed alternately darker and paler brown.

Diameter seven-eighths of an inch; axis three-fifths of an inch.

From Mr. Hawkins's collection.

The species most resembling it are *T. fimbriatus*, Lam., and *T. Buschii*, Phil.; but from these and all others it is well distinguished by its doubly crenate margin, as viewed from below. The profile outline is a little concave. It would belong to the section Polyodonta, of the genus.

Figure 221, profile of the shell; 221 *a*, base of the shell; 221 *b*, 221 *c*, details of the sculpture of the side and base, enlarged.

TROCHUS GRADATUS (*Gould*).

Testa parva, solida, perforata, ovato-conica, turrata, cinerea ferrugineo-flammulata: spira anfractibus quinque declivibus, ultimo carinis

duabus biangulato quorum suprema secundum spiram volvat ; interspatio trilineato et concinnè clathrato : basis convexiuscula, liris granulatis concentricis ad octo insculpta ; umbilico amplo, infundibuliformi : apertura circularis ; columellâ tenui, rectâ, anticè dentiferâ.

Trochus gradatus, GOULD ; Proceed. Boston Soc. Nat. Hist., iii. 91. March 1849. Expedition Shells, 56.

SHELL small, solid, ovate-conical, turreted, composed of five whorls, the larger of which is biangular, presenting a nearly horizontal portion next the suture, ornamented with five revolving, beaded lines, of which the one next the suture is largest, a vertical portion at the periphery, and a moderately convex base : the upper angle is marked by an elevated, rounded carina, which is continued around the middle of the upper whorls, to the apex : the lower angle is marked by a much less conspicuous carina ; between the two is a central, revolving thread, with a much more delicate one on each side ; the interspaces are minutely clathrate : the base is largely umbilicated ; the adjacent portion bony-white, corrugated, and faintly subdivided by a revolving furrow, and circumscribed by a deep furrow, barred with lines of growth ; between this and the periphery are seven or eight beaded lines, the outermost of which is largest : aperture circular ; interior dull white ; columella vertical, broad, and somewhat dentate at base, thin, and barely forming a septum at the umbilicus : colour cinereous, with about eight rusty-red, radiating flammules : tip yellow.

Similar to *T. sulcatus*, Wood, but has a more elevated spire, more varied colours, and a plain, rib-like carina at the angles, instead of spiny nodules ; the columella also differs. In most respects it is like *T. eximius*, Reeve, which, however, is imperforate.

Figure 210, profile of the shell ; 210 *a*, base of the shell ; 210 *b*, 210 *c*, sculpture of the side and base, enlarged.

TRUCHUS CIRCUMSUTUS (*Gould*).

Testa solida, elevata, accuratè conica, imperforata : spira anfractibus novem subangulatis, supernè declivibus, infra nodis obliquis et liris granosis cinctis : color cinerea, portionibus cavatis saturatè olivaceis suturas simulantibus : basis planulata, sulcis filiformibus concentricis

ad duodecim insculpta; regione umbilicali eburneâ: apertura transversa, sub-rhombea; columellâ brevi, acutâ, contortâ.

Trochus circumsutus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 106. April 1849. Expedition Shells, 57.

SHELL solid, of medium size, elevated, regularly conical, flat at base, acute at apex, composed of nine or ten whorls, which are declivous below the suture, with the lower half vertical, and marked with slightly oblique, wave-like nodules. The whole surface is sculptured by raised, revolving lines, four on the vertical portion of the whorl, with a broad one next the suture, and two succeeding small ones. The ground colour of the shell is ashy-white, but all the depressed portions are dusky-olive, giving the surface the appearance of being regularly stitched with olive, the series at the suture being much the coarsest. Base cinereous, imperforate, flat; the umbilical region polished; the remainder with about twelve regular, concentric, fine grooves. Aperture transverse, oval; columella short, sharp, contorted.

Diameter nine-tenths of an inch; axis the same.

Inhabits Madagascar?

In form and sculpture this may be compared with the tip of *T. pica*. The peculiar coloration, representing courses of olive-coloured stitches, is characteristic.

Figure 220, profile of the shell; 220 *a*, base of the shell; 220 *b*, sculpture of the base, enlarged.

TROCHUS JUCUNDUS (*Gould*).

Testa parva, solida, conica, flammulis radiantibus invicem coccineis incarnatis et albis picta: spira anfractibus sex sub-angulatis, filis granulosis alternis minoribus cinctis: basis convexiuscula, imperforata, liris concentricis linearibus articulatis pictis insculpta; regione umbilicali indentatâ: apertura rhomboidea; columellâ arcuatâ, lævi; labro simplici.

Trochus jucundus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 91. March 1849. Expedition Shells, 56.

SHELL small, solid, low conical, composed of about six conical whorls, with a slight vertical portion at base; the whole girdled with fine, uniform, beaded lines, the alternate ones being generally smaller, sometimes even not beaded, and the two basal ones surrounding the vertical portion being larger: base a little convex, similarly sculptured with about twelve concentric lines, gradually diminishing from the centre to the circumference; the umbilical region colourless, not perforated, and with a groove-like impression beside the columella; aperture rhomboidal-orbiculate; columella arcuate, smooth; lip simple: colours arranged in radiating flammules, alternately white, strawberry-red, and pale flesh-colour, gradually shaded into each other; on the base the dark or light red are distributed along the granules in a somewhat articulate manner; nacreous beneath.

Axis three-eighths of an inch; diameter two-fifths of an inch.

Inhabits New Zealand.

A very beautiful shell, both in colour and sculpture, quite distinct from any described species.

Figures 209, 209 *a*, side and base of the shell; 209 *b*, the sculpture.

TRUCHUS ELISUS (*Gould*).

Testa parva, elevato-conica, imperforata, cinerea: spira anfractibus sex declivibus, suturâ fossali valdè profundâ discretis, costulis transversis granosis tribus (quorum intermediani minore) cincta, interspatiis clathratis: basis convexa, costulis clathratis insculpta: apertura sub-circularis; columellâ granulâtâ; labro intus sulcato.

Trochus elisus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 92. March 1849. Expedition Shells, 92.

SHELL conical, solid, imperforate, cinereous: whorls six, flat, separated by a large and very deep channel, each of them encircled by three ribs, the central one less than half the size of the larger ones.

and all of them beaded by the passage of a regular series of bars across them, which, as they cross the interstices of the ribs, leave deep pits, and crenulate the outer edges of the external ribs; the third rib on the basal whorl forms an angle; the base is convex, with six fine, equal ribs, barred in a similar manner. Aperture small, subcircular; columella straight, denticulated with four or five minute, unequal folds; interior pearly, with a regular series of thin, delicate, revolving ribs.

Axis half an inch; diameter three-eighths of an inch.

Dredged at Singapore. *Pickering*.

This beautiful little conical shell is distinct from any described species. Its markings are deeply sculptured, and its peculiar sutural region is a character which cannot fail to be noticed at first glance. As it was obtained by the dredge, it is quite probable that it may be coloured differently when in the fresh state.

Figure 216, the profile; and 216 *a*, the base of the shell; 216 *b*, 216 *c*, details of the sculpture.

TROCHUS ACINOSUS (*Gould*).

Testa solida, convexo-conica, æruginosa, seriebus quaternis papillarum insignis et lineolis capillaceis volventibus ubique insculpta; serie anticâ majori: spira anfractibus sex planiusculis, ultimo acutangulato: basis excavata, cinerea, filis concentricis fuscis cincta; interspatiis indentatis; regione umbilicali infundibuliformi et costis duabus tri-partitâ: apertura rhombea; columellâ lævi, contortâ; labro simplici, perobliquo.

Trochus acinosus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 92. March 1849. Expedition Shells, 57.

SHELL rather small, solid, conical, with the outline of the profile a little convex; the base flat, concave, with a more distinct, central, tunnel-shaped pit, the walls of which are subdivided by two revolving white ribs: whorls about six, nearly flat, each one having at the

base a series of larger bead-like papillæ, and above these three series of smaller beads; the space between the lowest of these and the basal series being widest, and somewhat excavated; all the intermediate spaces are marked by numerous, very minute, revolving, raised lines, which, on inspection with a magnifier, are also found to be minutely barred with the lines of growth; periphery of the last whorl acutely angular: colour, before cleaning, a very dusky green; when touched by acid, bright emerald-green: base pale, cinereous, marked with dusky, raised, revolving, thread-like lines, which are largest near the umbilical pit, and have the interspaces finely indented; aperture rhomboidal, the outer lip very oblique, without internal striæ; columella contorted at base, forming an obtuse tooth; smooth and rounded elsewhere.

Diameter four-fifths of an inch; axis five-eighths of an inch.

Inhabits New Zealand.

There are several species which have the same kind of umbilical vortex, the same general form, and the same general sculpture. The peculiarity of this species is the arrangement of the granules above the fine secondary sculpture in which they are placed, the excavated base, with its thread-like, unbeaded lines, and the two white ribs in the umbilical pit. It may be compared with *T. vernus*, Chem.

Figure 217, profile of the shell; 217 *a*, base of the shell; 217 *b*, and 217 *c*, details of the sculpture of the side and base, enlarged.

TROCHUS PRUNINUS (*Gould*).

Testa solidula, elevata, ovato-conica, lævis, nitida, prunina, lineis capillaceis albis numerosis cincta: spira anfractibus septem convexiusculis, ultimo subangulato; suturâ profundâ: apertura subcircularis; columellâ rotundatâ, albâ, anticè roseo-tinctâ, subsinuosâ: interior margaritacea, vividè iridescens.

Trochus pruninus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 90. March 1849. Expedition Shells, 55.

SHELL ovate-conic, imperforate, rather solid, smooth, shining, pale plum-colour, paler at tip, girdled with numerous, crowded, regularly spaced, white hair-lines; nacreous under the surface; whorls seven, slightly convex, the basal one somewhat angular; suture deep; aperture nearly circular, slightly produced outwardly; columella smooth, rounded, white, with a rosy tint at base, very slightly sinuous: interior pearly, highly iridescent.

Inhabits the Auckland Islands, Atlantic Ocean.

This peculiarly coloured species has the form, thickness, and appearance of the delicately lineated specimens of *Littorina angulifera*, like *T. capillaceus*, PHILIPPI, in Menke's Zeitsch., 1848, 102.

Figures 205, 205 a, two views of the shell.

TRUCHUS TEXTURATUS (*Gould*).

Testa conica, imperforata, solida, cinerea viridi vel roseo-tincta, liris volventibus roseo-maculatis et laminis incrementi tenuibus clathrata: spira anfractibus septem, vix convexis, ultimo sub-angulato: apertura rotundata, anticè evoluta; columellâ rotundatâ; labro declivi, acuto: interior margaritacea, iridescens.

Trochus texturatus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 90. March 1849. Expedition Shells, 55.

SHELL conical, imperforate, solid, girdled with about five obtuse ribs on the upper, and nine on the lower whorls; colour cinereous, tinted green or roseate, generally faintly tessellated with pale rose spots on the ribs; intercostal spaces half the breadth of the ribs: surface having the lines of growth faintly laminated, and crossed by fine, revolving lines; when somewhat worn, the prominence of the rib becomes smooth, and the cancellated sculpture appears only in the interspaces; nacreous underneath, as appears by its roseate pearly tip. Whorls seven, scarcely convex, the basal one obtusely angular: aperture nearly circular, somewhat effuse at base: columella rounded, edged with green; outer lip bevelled within; interior pearly, faintly greenish, scarcely iridescent. Operculum thin, horny, multispiral.

Axis one inch ; diameter seven-tenths of an inch.

May well be compared with the coarse, solid, sulcated variety of *Littorina angulifera*.

Figure 206, front view of the shell ; 206 *a*, base of the shell ; 206 *b*, sculpture, enlarged.

TROCHUS ATER (LESSON), Voy. de la Coquille, Moll., pl. 16, f. 2.
PHILIPPI, Abbild. i., 188, pl. 5, f. 6.

ANIMAL dusky-brown above : foot rounded oblong, with a median longitudinal furrow, slightly notched in front, bright ochre-colour. Head large and distinct, prolonged into a sort of muzzle, very dark brown above, ochreous beneath, around the mouth. Tentacles very long and slender, slaty above, yellowish beneath, and finely annulated with black. Eye pedicles one-fourth the length of the tentacles, divided from them quite to the base ; lateral veil, a narrow, undulating fringe, bearing on each side four equidistant cirrhi. Mantle light ochreous. Operculum thin, horny, light brown, fading to horn-colour when dried.

It inhabits the crevices of rocks washed by the surf, at Valparaiso ; a smaller variety is found at Callao. It is very active in its movements.

[J. P. C.]

Figure 211, shell, with the animal, as in motion.

TROCHUS ARAUCANUS (D'Orbigny), Amer. Merid., pl. 55, f. 5-8.

ANIMAL glossy black above, cream-coloured beneath : mantle ochreous : tentacles obscurely annulated with black : ocular pedicles large, and free one-third the distance to the base of the tentacles ; lateral membrane furnished with four moderately long filaments on each side, the two anterior ones more widely separated than the others and longer. Foot remarkable for a slight posterior emargination, which frequently presents a bilobed appearance in crawling. When in motion the foot is often narrowed and protruded far in front of the shell, till it resembles the animal of *Voluta*.

It was found in the greatest abundance under stones above low-water mark in the harbour of Valparaiso, and also at San Lorenzo, but smaller. Nearly all the shells found at the former locality were also found at the latter; but it is remarkable that those found at San Lorenzo were invariably much smaller than the Chilian specimens, though the climate is so much warmer. [J. P. C.]

Figure 213, shell, with the animal, as in motion.

TROCHUS MÆSTUS (JONAS), in Menke's Zeitsch. für Malak., 1844, 113.

The variety of this species is so remarkable on account of its less elevated form, and its peculiar circle of sutural scales, that a figure of it is deemed advisable. In its more essential characters it accords with type specimens.

Figure 214, profile view of the shell.

TROCHUS COLUBRINUS (Gould).

Testa depressa, conico-globosa, imperforata, olivacea maculis subquadratis hepaticis tessellata, sulcis inequalibus minimè profundis cincta: spira anfractibus quinque, planiusculis, ultimo ad peripheriam obtusè angulato: basis convexiuscula, regione centrali absque colorem: apertura semi-circularis; columellâ acutâ, anticè truncatâ et dentem mentiente; labro acuto, viridi; fauce submargaritaceâ.

Trochus (Monodonta) *colubrinus*, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 107. April 1849. Expedition Shells, 58.

ANIMAL. Foot broad, narrowed behind, faintly channeled along the middle beneath, and coloured olive-green, with ramifications of deeper green; above dark green mottled with brown; head distinct, flattened, mottled with black; tentacles very long and slender, pale-brown, with transverse black lines; eyes on long, detached pedicles: lateral membrane incised for only a short space on each side of the head, furnished on each side with three long annulated cirrhi. Neck rose-coloured.

Mouth at the end of a short proboscis, armed with a pair of jaws, each formed of two subtriangular pieces; lingual ribbon broad, with longitudinal ranges of flat spinous processes on each side of the median jointed cartilage; the margin fleshy and involute.

SHELL low conic-globose, rather thin, imperforate, obtusely angular at the periphery: whorls five, somewhat flattened, and grooved with shallow, unequal, rather broad revolving sulci, quite fine on the base; suture impressed. Aperture obliquely semicircular; lip sharp, green at the edge, submargin opaque white; columella acute, with a slight gibbosity at the middle; base moderately convex and colourless; general colour olivaceous, usually tessellated above and below by dark maroon-coloured, sub-quadrate spots; fauces pearly, iridescent.

Diameter seven-eighths of an inch; axis six-eighths of an inch.

Obtained on the rocks west of Funchal, Madeira Island. [J. P. C.]

This shell has the form and texture of *T. umbilicaris*. It seems not to be an uncommon shell, and yet I find no description answering to the specimens I have seen. There are three distinct varieties.

1. The most common has the whorls convex, with faint revolving striæ of a deep olive-green, with dusky-red maculations. Figure 223.

2. Whorls convex, shell more conical, quite smooth, uniform green, save on the base at the umbilical region, which has a delicate rose-tint. Figure 223 *a*.

3. Rather depressed, the whorls subcarinate, strongly striate, green, tessellated with red; foot of the animal colourless. Figure 223 *b*.

TRUCHUS TANTILLUS (*Gould*).

Testa minuta, conico-discoidea, flavido-cinerea, lineis radiantibus flexuosis fuscis picta: spira depressa, anfractibus quatuor ad quinque angulatis, ultimo ad peripheriam dilatato, acuto: basis convexiuscula, perforata, flavida, liris duabus concentricis proclivibus munita: apertura obliquissima.

Trochus tantillus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 118. May 1849. Expedition Shells, 59.

SHELL minute, thin, low pyramidal, almost discoidal, of a dark-yellowish ash-colour, minutely lineated with fine radiating, zigzag, dusky lines. Whorls four or five, the basal one having the periphery compressed to a thin, sharp edge, and having a well-marked intermediate angle between the edge and the suture, which angle is continued upon the middle of the smaller whorls. Base slightly convex, perforated with a minute, tunnel-shaped umbilicus, and having upon it two concentric ridges, with deep grooves undermining them on their outer edge. Central area yellowish, with the ridges somewhat tessellated with dusky. Aperture very oblique, outline regularly arcuated throughout. Operculum horny, multispiral.

Diameter one-eighth of an inch; axis one-twelfth of an inch.

Inhabits the Sandwich Islands.

I have met with no description of a species so small as this, and yet its characters are very prominent. Its form and concentric ridges give it the aspect of a conical operculum.

Figures 215, 215 *a*, two views of the shell, enlarged; 215 *b*, natural size.

TROCHUS LIGATUS (*Gould*).

Testa solida, ovato-conica, imperforata, costulis rotundatis flavescentibus ubique cincta, intervallis incarnatis concinnè clathratis, ad apicem violacea: spira anfractibus sex convexis: apertura circularis; columellâ rectâ rotundatâ; labro crenulato: regio umbilicalis vix indentata.

Trochus ligatus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 91. March 1849. Expedition Shells, 35.

SHELL ovate-pyramidal, solid, imperforate, everywhere girded with rounded, pale-yellowish ribs, about six on the upper whorls, alternating with excavated, deep flesh-coloured intervals of about equal width; smooth on the ribs, with delicate laminæ of growth in the interspaces; tip violet; spire with six whorls convexly rounded, quite angular at

the base in the smaller specimens: aperture circular; columella rounded, straight, a little excavated in the umbilical region: outer lip crenulated by the sulcations; ribs and sulcations very slight on the base.

Axis three-fourths of an inch; diameter two-thirds of an inch.

Inhabits Puget Sound, Oregon. *Lieut. Case.*

This shell resembles, in most respects, *T. doliarius*; small specimens are like *Margarita cinerea*, Couth.

Figures 207, and 207 *a*, front and base of the shell; 207 *b*, details of the sculpture.

TROCHUS PUPILLUS (*Gould*).

Testa parva, elevato-conica, margaritacea extrinsecus incana, filis viridofuscis ubique cincta, ad intervallos minutissimè clathrata: spira anfractibus sex convexis: basis planiuscula, fissurâ umbilicali perforata: apertura circularis; columellâ arcuatâ: faux fulgida, minutissimè punctata.

Trochus pupillus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 91. March 1850. Expedition Shells, 56.

SHELL small, ovate-conic, rather solid, perforate, ash-coloured, with darker greenish on the ribs, sub-surface brilliant silvery; surface with small, flattened, nearly equal and equidistant ribs, about five on the upper whorls separated by interspaces of the same width, and with fine, crowded, lamellar lines of growth, by which the interspaces are distinctly barred: spire of six convex whorls, the last obtusely angular, flattened at base, and with much finer and more crowded ribs and grooves. Aperture circular; columella somewhat arcuate, with a minute, groove-like umbilicus at its side; lip sharp; interior pale and opaque near the lip; minutely punctured, and with crimson iridescence within.

Length of axis three-tenths of an inch; diameter one-fourth of an inch.

Inhabits New Zealand.

Somewhat similar to *T. ligatus*, but much smaller, more delicate, more nacreous within, and partially umbilicated. It is still more like *Margarita cinerea*, but is more solid, and more delicately marked.

Figure 208, the shell in profile; 208 *a*, base of the shell; 208 *b*, details of the sculpture, enlarged.

TRUCHUS AMÆNUS (*Gould*).

Testa parvula, depressa, globoso-conica, levis, nitida, fusca, punctis luteis ubique irrorata, et maculis piceis cum flavidis alternantibus ad suturam et ad peripheriam ornata: spira anfractibus quatuor ad quinque convexis, ad suturam constrictis: basis convexa, imperforata, concentricè striata: apertura sub-circularis; regione columellari complanatâ, albâ; columellâ anticè dentiferâ; labro acuto, striato; fauce lividâ, margaritaceâ.

Trochus amœnus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 107. April 1849. Expedition Shells, 58.

SHELL quite small, depressed, globose-conic, smooth and shining above, with only delicate lines of growth above, and with very delicate concentric striæ beneath; whorls four or five, convex, slightly constricted at suture, which is linear impressed; colour chocolate, whole shell speckled with minute yellowish spots, with a series of quadrate black dots, articulate with yellow, adjacent to the suture, generally another series of smaller ones at the periphery, and sometimes still another at base; base imperforate; columellar region flattened, having a slight umbilical indentation, bony-white, having towards the base a transversely oblique, faint rib, which causes a slight tooth or gibbosity on the columella; edge of the outer lip bevelled; within livid pearly, having numerous raised lines.

Diameter three-tenths of an inch; axis one-fifth of an inch.

Inhabits the Feejee Islands.

A pretty shell, allied to some of the Mediterranean species, like *T.*

Lessoni. Its small size, minutely freckled surface, with the articulated bands of black and yellow, may mark it.

Figures 218, 218 *a*, 218 *b*, three views of the shell, enlarged; 218 *c*, natural size.

TROCHUS SPURCUS (*Gould*).

Testa parva, solida, globoso-conica, nitida, ubique striis volventibus exilibus insculpta, obliquè strigis angulatis stramineis et fuscis alternantibus variegata, propè suturam maculis quadratis quoque picta: spira anfractibus quatuor ad quinque ventricosis, ultimo subangulato; suturâ impressâ: basis concavo-conica, imperforata vel arcuè umbilicata: apertura perobliqua, circularis; columellâ arcuatâ; labro acuto, simplici; fauce submargaritaceâ.

Trochus spurcus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 106. April 1849. Expedition Shells, 58.

SHELL small, solid, globose-conic, everywhere sculptured with fine, shallow, revolving, alternate grooves and elevations; shining, of a dingy yellowish colour, delicately variegated with oblique, zigzag, dusky lines, the two colours in about equal proportions, a series of somewhat conspicuous quadrate, dusky and yellow spots just below the suture; whorls four or five, ventricose, suture deeply impressed, the last subangular at periphery; base moderately conical, imperforate or minutely umbilicated; aperture very oblique, circular; columella rounded, arcuate; lip sharp, smooth within, and sub-nacreous.

Diameter three-eighths of an inch; axis three-tenths of an inch.

Inhabits the Madeira Islands. *Couthouy*.

Has most of the characters of *T. Fermoni*, but is very much smaller; it wants the peculiar channeled shoulder of the whorls, and the widely open umbilicus.

Figures 219, 219 *a*, 219 *b*, three views of the shell, enlarged; 219 *c*, natural size.

TROCHUS (MONODONTA) ATROPURPUREUS (*Gould*).

Testa parva, depressa, ovato-conica, atropurpurea, liris granulosis ubique cincta: spira anfractibus quinque ad sex, ultimo subangulato: basis convexiuscula, latè perforata; umbilico cavernoso, limine acuto, denticulato, propè columellam interrupto: apertura circularis; columellâ obliquâ, acutâ, anticè dentatâ, emarginatâ; labro albo et nigro articulado, intus sulcato; fauce margaritaceâ.

Trochus (Monodonta) atropurpureus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 107. April 1849. Expedition Shells, 59.

ANIMAL elongated, angles of the foot dilated, behind pointed; disk of the foot cream-coloured; head transversely oval; veil ochreous; cirrhi long, yellow; above striped with delicate, alternately slate-coloured and yellow lines; head transversely striped in the same manner; eye-pedicles with finely lobed auricles.

SHELL small, solid, depressed, ovate-conical, of a purplish-black colour: spire of five to six moderately convex whorls, separated by a deeply-impressed suture, and girt with uniform series of lines of elevated granules, of which there are six upon the smaller whorls, and about sixteen on the larger one, including the base: periphery of the last whorl very obtusely angular: base moderately convex, and largely perforated, the region surrounding the umbilicus white, and forming a sharp, denticulate margin to it, the tooth near the upper commissure of the aperture being much the largest where the circle of the umbilicus becomes incomplete, not attaining the columella, so that a part of the wall between the umbilicus and aperture is wanting: columella oblique, denticulate, a denticle above and below: aperture nearly circular, a little modified by the columella, at the base of which is an emargination: lip white, margined with articulated black and white spots; inner edge corrugate, striate: fauces pearly.

Axis one-fifth of an inch; diameter three-tenths of an inch.

Obtained at Pango-pango, island of Tutuilla, Samoa Group.

Allied to *T. pharaonis* and *T. canaliculata*, in its habitus and um-

bilicus, but more like *T. corallinus* in size and general characters. Its uniform colour and granulation, toothed margin of the umbilicus, with the conspicuous tooth above, are its characters.

Figure 224, the shell seen from above, enlarged; 224 *a*, shell, with the animal as in motion; 224 *b*, locomotive disk; 224 *c*, sculpture, enlarged; 224 *d*, aperture and umbilical region, in outline.

TROCHUS (MONODONTA) INSTRACTUS (Gould).

Testa parva, elevata, ovato-conica, arctè perforata, albida et maculis dilutè rufis propè suturam picta: spira anfractibus quinque convexiusculis, sub-imbricatis, suturâ profundâ canaliformi sejunctis, liris acutis ubique cinctis, interspatiis concinnè clathratis: basis convexa: apertura obliquè semicircularis; columellâ acutâ, obliquâ, in dentem terminante; labro incrassato, intus sulcato, juxta columellam rugoso et emarginato.

Trochus (Monodonta) instrictus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 107. April 1849. Expedition Shells, 59.

SHELL small, elevated, ovate-conic, solid, white, with a series of about ten rufous spots near the suture; whorls five, forming a conical spire, ventricose, with delicate, highly elevated rib-striæ, of which there are about five on the upper, and ten on the last whorl: the surface of the ribs is slightly tuberculous, and the last one overhangs the succeeding whorl, so as to produce a broad, deep channel at the suture: the interspaces have about the same width as the ribs, and are beautifully barred with close-set laminæ: base convex, with a small, deep, scalariform umbilicus, sculptured like the spire: aperture obliquely semicircular; lip crenulated by the ribs, conspicuously sulcate within: columella sharp, oblique, armed with a fully-developed sharp tooth at base, succeeded by a deep basal notch.

Length of the axis three-eighths of an inch; diameter three-tenths of an inch.

Obtained in the Pacific Ocean.

A pretty species of the same type as *M. canaliculatus*, but smaller, more conical, and entirely different in colour.

Figures 225, 225 *a*, two views of the shell, enlarged; 225 *b*, details of the sculpture; 225 *c*, natural size.

TRUCHUS (MONODONTA) ROTELLINUS.

Testa parva, solida, lenticularis, nitida, fissurâ latebrosâ perforata, dilutè incarnata, flammulis flexuosis saturatioribus, et seriebus duobus transversis macularum fuscæ variegata: spira anfractibus quinque convexiusculis: apertura parva, subcircularis; columellâ perobliquâ, arcuatâ, posticè ab anfractu sejunctâ, anticè in dentem acutum terminante; labro propè dentem quasi emarginato.

Trochus (Monodonta) rotellinus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 108. April 1850. Expedition Shells, 59.

SHELL small, solid, discoidal-lenticular, smooth, polished; whorls six or less, forming a smooth, slightly convex disk above, with the suture very delicate; beneath nearly as convex, apparently imperforate, but, on a close examination, a fissure-like perforation will be found, entering from the aperture in a very oblique manner: aperture small, nearly circular, with a mimic canal at the base: columella very oblique, crescentic, disjoined from the penultimate whorl, and ending abruptly below in a tooth, forming the margin of the basal notch: lip simple, pale flesh-coloured, with zigzag radiations of deeper colour, and also two series of small quadrate dots, one on each side of the periphery, the upper one continued up the spire and seen on the edge of the suture.

Diameter three-eighths of an inch; axis one-fifth of an inch.

Inhabits Mangsi Island, China Sea. *Pickering*.

This curious little shell would at first be taken, by its form, lustre, and coloration, for a *Rotella*; while the notch of the aperture resembles *Buccinum neriteum*, but its umbilicus and columella place it with *Monodonta*.

Figures 222, 222 *a*, 222 *b*, three views of the shell.

TROCHUS (BEMBICIUM) SQUAMIFERUS ? (Koch).

The animal of a shell, which seems to belong to the species above mentioned, is interesting as showing that the genus *Bembicium*, proposed by Philippi, is founded in zoological as well as testaceological characters. It has an elongated proboscis, transversely lineated, and a vertical mouth; the tentacles are long, annulated, with the eyes on their enlarged base; there are no ocular auricles, and no lateral cirrhi.

The shell seems to be destitute of the pearly structure of the *Trochidæ* in general.

Figure 227, the shell, with the animal as in motion; 227 *a*, the locomotive disk.

MARGARITA MAGELLANICA (Gould).

Testa depresso-conica, solida, imperforata, polita, rufa, interdum sordidè flavescens: spira anfractibus quinque ad sex convexis, ultimo ad peripheriam sub-angulato: basis tumida: apertura ampla, subcircularis; columellâ rotundatâ, vix arcuatâ angulum basalem cum labro efformante: faux vividè iridescens.

ANIMAL pale ochreous; head prolonged into a sort of hood, the lappets of which curve outwardly upon the foot with the mouth between them: tentacles very long and slender, with large and bright eyes on a bulbous protuberance at the base: body with a lateral veil passing from behind the head to the operculum, bearing on each side four slender filaments, the second and third more remote from each other than the rest. Foot very long, narrow, attenuated backward, the anterior angles prolonged into a sort of tentacle on each side.
[J. P. C.]

SHELL small, low conical, smooth and shining, somewhat pearly; whorls five or six, convex, obtusely angular at the periphery; suture well marked: base convex, not centrally pitted: aperture nearly circular; lip sharp, and at the base forming a decided angle with the

columella, which is slightly oblique, narrow, and obtuse: interior vividly iridescent.

There are two well-marked varieties, viz.:

a. Thin, pearly, deep peach-blossom colour, the periphery decidedly angular, the fauces vividly iridescent, and the surface grooved with broad, shallow, transverse grooves.

b. Solid, pale dingy yellow, surface smooth, whorls appressed at the suture, periphery less angular, and with vestiges of an epidermis.

Axis five-eighths of an inch; diameter two-fifths of an inch.

Obtained at Orange Harbour, Tierra del Fuego. (*Couthouy.*)

This is perhaps the little *Trochus* spoken of by Quoy and Gaimard, as seen at the Falkland Islands.

Figure 228, shell, with the animal as in crawling; 228 *a*, plantar view of the animal; 228 *b*, front view of the shell; 228 *c*, the operculum.

MARGARITA PERSICA (*Gould*).

Testa parva, solida, depressa, ovato-conica, lævigata, nitida, intensè purpureo-incarnata: spira anfractibus quinque convexiusculis, superne declivibus, ad suturam confluentibus: basis convexa, medio indentata, pallida; columella lata, excavata, acuta, arcuata: apertura circularis; faux vivide iridescens.

SHELL small, solid, low ovate-conic, polished, of a peach-blossom colour: whorls five, convex, the largest declivous, with the periphery somewhat angular, at the suture closely appressed to the preceding whorl: beneath convex, the central region depressed and paler, not perforated. Aperture circular; columella sharp, broad, and excavated, continuous with the lip, so as to form no angle with it at the base.

Diameter half an inch; axis three-tenths of an inch.

From among Cape Horn shells.

This species is remarkable for its broad, crescentic, and somewhat excavated columella, much as in the genus *Lacuna*. In this respect, and in the absence of an angle at the base of the axis, it differs chiefly from *M. magellanica*. Both of them have somewhat the aspect of *Rotella*.

Figures 230, 230 *a*, two views of the shell; 230 *b*, outline of the aperture, enlarged.

MARGARITA CONICA (D'ORBIGNY), Voy. dans l'Amer. Merid.

ANIMAL quite colourless, and remarkable for the great length of its tentacles and lateral filaments, of which there are four on each side. Eyes very large and black, situated near the base of the tentacles, without any perceptible pedicle or enlargement. Foot long and narrow, obtuse posteriorly, truncate anteriorly, with no prolongation of the angles.

Brought up on the cable at Scapenham Bay, Patagonia. [J. P. C.]

Figure 229, the animal, with the shell, as in motion, magnified; 229 *a*, 229 *b*, enlarged view of the head, above and below; 229 *c*, natural size.

LACUNA CARINATA (*Gould*).

Testa parva, tenuis, ovato-globosa, epidermide corneo undulatim tenuistriato induta: spira anfractibus quinque ventricosus, ultimo carinâ filôsâ cincto: apertura semicircularis, dimidiam testæ adæquans; columellâ rotundatâ.

Lacuna carinata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 75. November 1848. Expedition Shells, 52.

The ANIMAL is much as in *Littorina*, with two filaments on the foot behind the operculum. Its motions were tolerably active; it crawled in an inverted position at the surface of the water, and when driven down, it hung by a thread of mucus, by means of which it

regained the surface, in the same manner as Rang's genus *Litiopa*. [*C. Pickering.*]

SHELL small, thin, ovate, covered with a greenish straw-coloured epidermis, which, under the magnifier, is found to be marked with numerous, crowded, undulating, revolving striæ: whorls five, ventricose, the last one having a raised thread-like carina at the periphery: aperture half the length of the shell, semicircular: canal of the columella semicylindrical, extending to the base: a delicate layer of callus on the penultimate whorl.

Length three-tenths of an inch; breadth one-fifth of an inch.

Inhabits Puget Sound; dredged at Classet. *Pickering.*

Very much like the dark variety of *L. vineta* of the Atlantic shores in colour and marking, but it is less elongated. Our shell occasionally has the last whorl perceptibly angular, but never with the filiform carina.

Figure 230, an elongated specimen; 230 *a*, a short specimen, front view; 230 *b*, back view of the same.

LITIOPA DECUSSATA (*Gould*).

Testa parvula, perfragilis, acuto-conica, badia: spira anfractibus octo convexis, transversim striatis, apicalibus plicatis: apertura ovata anticè subtruncata; labro simplici; columellâ arcuatâ, anticè unidentatâ.

Litiopa decussata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 75. Nov. 1848. Expedition Shells, 52.

ANIMAL light brown; head terminating in a probosciform muzzle; tentacles two, long, slender, obtuse; eyes black, just behind the tentacles; foot short, subquadrate, motions very lively.

SHELL conical, elongated, thin and fragile, dark brown, covered with a thin epidermis, lines of increment distinct, and these are

crossed by fine revolving striæ, so as to give the surface a decussated appearance; whorls eight, convex, slightly shouldered posteriorly, the last one half the length of the shell; suture well defined; aperture ovate, subtruncate at base; lip simple; columella arcuated and furnished at its lower portion with a broad, compressed, concave tooth; umbilical pit large and distinct, bounded externally by a somewhat prominent ridge; interior of a lighter shade of brown.

Length of axis three-fortieths of an inch; breadth one-fortieth.

Found on a floating bamboo, lat. 37° 40' N., long. 54° 30' W.
[J. P. C.]

Three other species of this genus have been noticed, namely, *L. melanostoma*, Rang, which has the lip black; *L. maculata*, Rang, which has two brown spots on each whorl; and *L. striata*, Pfeiffer, with which this agrees well, except that it is less than half the size.

Figure 232, front view of the shell, magnified; 232 *a*, natural size.

SOLARIUM EGENUM (*Gould*).

Testa parva, ovato-conica, exalbida, submargaritacea: spira anfractibus sex convexis, liris acutis quatuor cinctis, posterioribus granulatis: basis convexiuscula, perforata; umbilico scalariformi, ad ambitum acuto, crenulato: apertura circularis; labiis ferè continuis.

Solarium egenum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 84. March 1849. Expedition Shells, 54.

SHELL minute, low ovate-conic, thin, amply umbilicated, ashy-white, pearly beneath; whorls six, convex, the last obtusely angular, each one encircled by four sharply-compressed, well-elevated ribs, the two uppermost of which are beaded; interspaces concave, smooth; base convex, smooth, with a single groove near the margin of the umbilicus; the latter occupies one-third of the base, is tunnel-shaped, penetrating to the apex, its sides excavated on each whorl, the verge of which is crenulated: aperture nearly circular, slightly encroached upon by an inflection of the columella; lip simple: interior pearly.

Diameter three-tenths of an inch ; altitude one-fourth of an inch.

Inhabits New Zealand.

The characters of this shell do not bring it strictly within the typical form of *Solarium*, but its facies is rather that of *Solarium* than of *Trochus*. It is to be grouped with *S. dealbatum*, Hinds, which it closely resembles. It is also similar in form, colour, and size to *Margarita obscura*, Couthouy. Perhaps it would come under the genus *TORINIA*, Gray.

Figures 226, 226 *a*, the side and base of the shell, enlarged ; 226 *b*, details of the sculpture ; 226 *c*, natural size.

LITTORINA PATULA (*Gould*).

Testa magna, solida, rudis, rotundato-ovata, cinereo-olivacea albido maculata: spira anfractibus quinque, ultimo magno, ventricoso; suturâ vix impressâ: apertura ampla, rotunda; columellâ latâ, excavatâ, albâ; facie ventrali testæ quasi attritâ, et maculâ fuscâ notatâ; fauce castaneâ, anticè albo-vittatâ.

Littorina patula, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 83. March 1849. Expedition Shells, 52.

SHELL rather large, solid, rude, broad-ovate, grayish-olive, irregularly mottled longitudinally with whitish, marked with unequal and irregular striæ of growth, and a few delicate, broken, revolving lines: whorls five, the last one very large, ventricose; the others but little convex, forming a low, conical spire: suture faint, with something of a constriction in front of it, on the lower whorl. Aperture very large, the columella broad, white and excavated, and having the body of the whorl apparently abraded, so as to cause the mouth to seem circular, and presenting a dusky blotch at its upper portion; aperture chestnut-coloured, with a pale band in front: opercle dark chestnut.

Length three-fourths of an inch ; breadth half an inch.

Inhabits the rocks at the mouth of the harbour of San Francisco, California. *Dr. Pickering.*

Remarkable for the amplitude of the aperture, the broad excavated columella, and the apparent grinding away of a portion of the adjacent whorl by the operculum, and perhaps really so, as it is the part where the opercle would lie when the animal was protruded. It may be *L. planaxis*, Nuttall, no description of which has been published.

Figures 237, 237 *a*, two views of the shell.

LITTORINA CALIGINOSA (*Gould*).

Testa parva, ovata, tenuis, lævis vel lineis incrementalibus striata, epidermide fusco-virente luteo-maculato induta: spira apice erosâ, anfractibus quatuor ad quinque, ventricosis; suturâ profundâ: apertura vix dimidiam longitudinis testæ adequans, rotundato-ovata; labro continuo, acuto, pallido, vix everso; fauce lividâ.

Littorina caliginosa, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 83. March 1849. Expedition Shells, 53.

SHELL small, thin, smooth, or with faint lines of growth, ovate, covered with a deep grass-green epidermis, variegated with minute, scale-like, irregular spots of ochreous yellow: spire eroded at tip, of about four or five very ventricose whorls; suture deeply impressed: aperture less than half the length of the shell, rounded ovate; lip continuous, sharp, a little everted, pale; base with a slight tendency to an umbilicus; throat dark livid.

Length one-fifth of an inch; breadth one-eighth of an inch.

Inhabits Tierra del Fuego. *Couthouy.*

This small shell has the general form and characters of *L. tenebrosa*, and its structure and colour give it somewhat the appearance of a fresh-water shell. I believe it was found adhering to floating kelp.

A box of smaller specimens, marked 'N. Holland,' seem to be so near

in character, that I note them not as a distinct species. Perhaps there is an error in locality. They are variously coloured from pale yellowish-green to dark purple-brown.

Figures 240, 240 *a*, two views of the shell, enlarged; 240 *b*, natural size.

LITTORINA LEPIDA (*Gould*).

Testa parva, elongata, solida, biconica, nitida, livida vel sanguinea albido tessellata vel zonata præsertim propè suturam et ad peripheriam, spiralliter crebrè et tenuiter puncto-striata: spira acuto-conica, anfractibus quinque, ultimo angulato: apertura ovata; labro acuto, pallido; fauce rubrà, albo-zonatâ; columellâ planulatâ, sanguineâ.

Littorina lepida, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 83. March 1849. Expedition Shells, 52.

SHELL small, solid, ovate-conic, shining, dark slate-colour, generally sanguineous at base, finely tessellated or banded with white, with generally a more conspicuous articulated range of spots near the suture and at the angle of the last whorl: surface marked with very fine, sharp, and crowded revolving lines, which are somewhat punctate: spire of five flattened whorls, forming an acutely conical spire; basal one angular at the periphery: aperture about half the length of the shell, ovate; columella flattened at the base, bright flesh-colour, and forming a basal angle: interior reddish, with an anterior white band; edge of the lip sharp, generally pale.

Length two-fifths of an inch; breadth two-fifths of an inch.

Inhabits Puget Sound, Oregon. *Dr. Pickering.*

A small, biconical species like *L. lineata*, characterized by its finely puncto-striate sculpture, its range of articulate spots, and by the blood-red colour of the columella.

Figures 238, 238 *a*, two views of a checked specimen, enlarged; 238 *b*, dorsal view of the white variety, enlarged; 238 *c*, natural size.

LITTORINA SCUTULATA (*Gould*).

Testa parva, ovato-conica, plerumque erosa, castanea vel livida albido inordinatim maculata, striis obsoletis cincta: spira anfractibus quinque, ultimo ventricoso: apertura latè ovata; labro acuto, pallido; columellâ planatâ, antrorsum expansâ; fauce lividâ.

Littorina scutulata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 83. March 1849. Expedition Shells, 53.

SHELL small, ovate-conic, inelegant, usually eroded and dead at the surface, of a chestnut or dusky leaden hue, sparsely and obscurely tessellated with whitish; with a few obsolete revolving striæ: whorls five, convex, the last ventricose, rarely with the vestige of an angle: aperture not quite half the length of shell, broad-ovate; lip sharp and pale: columella flattened at base, which is somewhat expanded: interior livid.

Length of the axis three-fifths of an inch; breadth two-fifths of an inch.

Inhabits Puget Sound, Oregon. *Pickering*.

Allied to *L. tenebrosa*, but has a more elongate and acute spire; also to *L. lepida*, but is more inelegant, and without the colouring of the base and aperture of that shell.

Figures 241, 241 *a*, two views of the shell.

LITTORINA ACUMINATA (*Gould*).

Testa parva, solida, nitida, elongata, conico-turrita, livida obscure flammulata interdum maculis albidis articulatis cincta: spira acuta, anfractibus sex, planulatis, ultimo subangulato; suturâ profundâ: apertura ovata; columellâ nitidâ, mori-tinctâ.

Littorina acuminata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 84. March 1849. Expedition Shells, 53.

SHELL small, solid, symmetrical, elongated, ovate-conical, surface glossy, lines of growth very delicate, and with regular and regularly spaced, obtuse, revolving grooves and ridges: colour livid, paler above near the sutures, with faint, obliquely longitudinal flammules of darker, and sometimes a sutural and carinal range of pale spots: whorls six, forming an elongated, conical spire, slightly convex, the last one subangulate; suture deep: base low conical, more deeply striate: aperture oval, rounded at base; columella glossy, stained deep mulberry-colour.

Length three-tenths of an inch; breadth one-fifth of an inch.

Inhabits Mangsi Island, Sooloo Sea.

A small, much elongated species, in the style of *L. lineata*, known by its regular grooving, and its mulberry-tinted columella.

Figure 239, front view of a large specimen, magnified; 239 *a*, dorsal view of a small specimen, enlarged; 239 *b*, natural size.

LITTORINA PLENA (*Gould*).

Testa parva, solida, ovata, cinereo-olivacea, interdum albido reticulata, striis spiralibus insculpta: spira parva, acuta, anfractibus quinque, ultimo globoso, subangulato; suturâ profundâ: apertura parva, dilatata et angulata; columellâ planulatâ, rufâ, albido marginatâ; fauce castaneâ, albo-zonatâ.

Littorina plena, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 84. March 1849. Expedition Shells, 53.

SHELL small, solid, ovate, ashy-olive, sometimes faintly reticulated with paler: spire conical, acute; whorls five, the last globose and out of proportion to the others, sub-angular at its lower third; suture deep; surface generally marked with delicate, revolving lines; aperture rather small, sub-circular; lip produced at the base forming an angle; columella flattened at the base, reddish-brown, edged with pale: interior dusky-brown, with an anterior pale band.

Length of axis one-fourth of an inch; diameter one-fifth of an inch.

Inhabits the Bay of San Francisco, California.

Somewhat the same exterior as *L. acuminata*, but has not the elongated, conical form: the globoseness of the last whorl is remarkable; it is more polished, smaller, and with a smaller aperture than *L. scutulata*.

Figure 236, 236 *a*, two views of the shell, enlarged; 236 *b*, natural size.

LITTORINA OBESA (SOWERBY), Genera of Shells, f. 6.

ANIMAL with the foot thick and fleshy, pale ochreous beneath, and mottled with brown on the sides. Head prolonged, flesh-coloured about the mouth; tentacles long and slender, ochreous, with annuli of dusky-brown; eyes on an enlargement at the external base. Operculum of a clear, ruddy horn-colour. Motions very active.

Numerous specimens were found on the shores of the lagoon at Clermont Tonnerre; also at Honden Island, King's Island, Raraka, &c. [J. P. C.]

Figure 235, the animal, with the shell, as in motion; 235 *a*, locomotive disk of the animal.

LITTORINA PYRAMIDALIS (QUOY and GAIMARD), Voy. de l'Astrol., Atlas, pl. 33, f. 12-15.

The figure of the animal given by Quoy and Gaimard, is very in accurate. The sides are yellowish, with a median, longitudinal, orange stripe; the head and tentacles are slate-coloured; mantle pale orange beneath; disk cream-coloured, shaded greenish.

Figures 234, and 234 *a*, two views of the animal, with the shell.

LITTORINA GRANDINOSA (DESHAYES), *Trochus grandinosus*, CHEM., Conch., pl. 169, f. 1639; *Trochus bullatus*, MARTYNS, Univ. Conch., pl. 38; *Monodonta papillosa*, LAMARCK, An. sans Vert., ix. 172.

General colour of the animal gamboge-yellow, shaded with orange; proboscis russet above; disk of the foot pale cream-coloured: tentacles yellow, very faintly annulate.

Figures 233, 233 *a*, two views of the animal, with the shell.

LITTORINA PERUVIANA (GRAY), Beechey's Voyage, pl. 36, f. 8; *Turbo zebra*, WOOD, Sup., pl. 36, f. 8; *Phasianella Peruviana*, LAMARCK, An. sans Vert., ix. 172.

ANIMAL with the disk of the foot lemon-coloured, margined with dusky dots; sides, head and tentacles chocolate-coloured, with six or seven bluish-white blotches on each side; mouth brown; tentacles stout, subulate; the eyes on an enlargement one-third the distance from their base; a white line runs along the under side and encircles the eyes.

Found plentifully both at Valparaiso and Callao, those at the latter place being smaller, and sometimes entirely black.

The colouring of the animal, according to the above observation, is entirely different from that given by D'Orbigny, Amer. Merid., pl. 53, figs. 5-8. In his figure of *L. Araucana*, also, the eyes are represented as sessile at the internal base of the tentacles, a position entirely incompatible with the character of the genus.

PLANAXIS LINEOLATUS (Gould).

Testa minuta, solida, acuto-conica, ex albido fuscescens, lineis castaneis numerosis cincta: spira acuta, anfractibus sex ad octo planulatis, supernis granulatis, ultimo trientes duos testæ longitudinis æquante, ad peripheriam sub-angulato: basis spiraliter striata: apertura rotundato-ovata, posticè haud callifera; labro pallido, vel fusco tessellato, intus denticulato; fauce fuscâ.

Planaxis lineolatus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 118. May 1849. Expedition Shells, 60.

SHELL minute, solid, acute-conical, drab or chestnut coloured, surrounded with numerous, delicate, dark chestnut bands: spire with six or eight whorls, flat, those of the apex somewhat granulated; the last one two-thirds the length of shell, somewhat angular at periphery, with a few coarse, revolving striæ at base. Aperture less than half the length of shell, broad-ovate, without callus posteriorly; siphonal notch nearly closed, edged black; edge of the lip pale or tessellated with chestnut: throat dusky: inner edge denticulate.

Length one-fourth of an inch; breadth one-eighth of an inch.

Inhabits Wilson's Islands, Paumotu Group.

This little shell is not unfrequent in cabinets, but I find no description of it.

Figures 251, 251 *a*, two views of the shell, magnified; 251 *b*, natural size.

MELAMPUS MUCRONATUS (*Gould*).

Testa parva, ovoidea, glabra, anticè attenuata, basi acuta dilutè flavo-livescens, anticè subtilissimè undulato-striata: spira conica, mucronata, anfractibus octo planulatis, ultimo supernè angulato: apertura linearis labro intus incrassato, octo-dentato; labro tri- vel quadri-dentato.

Melampus mucronatus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 1849.

SHELL small, of an elongated, ovoid or rhomboid shape, thin and shining, of a pale straw-yellow colour, somewhat tinged with livid, more especially about the tip. It is rapidly narrowed anteriorly, and terminates acutely; and around the anterior portion it is minutely striated with undulating lines. The spire, beginning with the upper fourth of the outer whorl, is elevated conical, with a sharp, elongated point at tip, and composed of ten flattened whorls, barely defined by

the suture, which is usually margined. The aperture is three-fourths the length of the shell, very narrow, slightly widened in front; interior of the lip thickened, and bearing eight lamellar teeth, which extend far into the shell; the inner lip bears three, sometimes four teeth, of which one on the columella, continuous with the lip, is much the largest.

Length three-tenths of an inch; breadth two-tenths of an inch.

Inhabits Raraka Island, Paumotu Group.

Remarkable for its colour and shape. It is unusually acute in front. It possibly may be the young of *M. lutea*.

Figure 242, dorsal view of the shell, enlarged; 242 *a*, ventral view of the shell, natural size; 242 *b*, aperture, enlarged.

SCALARIA GRACILENTA (*Gould*).

Testa minuta, gracilis, elongato-turrita, alba, costis longitudinalibus tenuibus ad sexdecem clathrata, spiraliter inter costas striata, imperforata: spira anfractibus novem cylindræis, contiguïs; suturâ profundâ: apertura circularis, ab anfractu penultimo haud sejuncta: labro continuo, reflexo, posticè et ad columellæ basim dilatato.

Scalaria gracilentæ, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 252. December 1847.

SHELL minute, turreted, very long and slender, white, barred with about sixteen delicate ribs, the spaces between which are crossed by spiral lines. The spire is composed of nine cylindrical whorls, sufficiently united, deeply girt in at the suture. The aperture is circular, not detached from the preceding whorl; lip reflected, widened posteriorly, and at the base of the columella.

Length one-fourth of an inch; breadth one-sixteenth of an inch.

Inhabits Mangsi Island, China Sea.

One of the most slender and delicate species of the genus, resem-

bling the figure of *S. gracilis*, Sowb., but agreeing still more, in its characters, with *S. turricula*, Sowb.

Figure 245, front view of the shell, magnified ; 245 *a*, natural size ; 245 *b*, view at the suture, enlarged.

SCALARIA TEXTURATA (*Gould*).

Testa parva, tenuis, elongato-turrita, pubescens, subperforata : spira anfractibus rotundatis octo ferè solutis, costis novem albidis, elevatis, reflexis, supernè spinosis clathrata, et striolis inter costas confertissimè texturata : apertura circularis.

Scalaria texturata, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 252. December 1847.

SHELL small, slender and turreted, rather thin, and of a pale flesh-colour. It is barred with nine series of elevated, reflexed, whitish ribs, which, on the larger whorls, are armed posteriorly near the suture, with sharp spines. Between the ribs the space is finely sculptured with minute, revolving lines. Whorls eight, cylindrical, and nearly separated from each other. Aperture circular. The umbilicus, if existing, is very small, and obscured by the numerous ribs converging there.

Length one-third of an inch ; breadth one-fifth of an inch.

Habitat unknown.

A very pretty, slender species, and well characterized by the numerous striæ between the ribs, forming a delicate network. It is allied to *S. turricula*, Sowb., which has only revolving lines, is less conical, and its whorls are less rounded.

Figure 244, view of the shell in front, magnified ; 244 *a*, junction of whorls at the suture, enlarged ; 244 *b*, natural size.

SCALARIA AUSTRALIS (LAMARCK), Anim. sans Vert., ix. 76. Sow-

ERBY; Genera of Shells, fig. 4. GUERIN; Magasin de Zool., pl. 40.
KIENER; Iconog., pl. vi. f. 17.

The shell in question is marked as occurring at Puget Sound. I at first regarded it as new, and described it under the name of *S. borealis*; but, upon close examination, I can see no other difference between the northern and southern shell, than the number of ribs, which are eight in the northern and ten in the southern shell. It would be very strange to find species identical at points so remote from each other on opposite sides of the equator while we might expect to find them analogous; and I cannot but think, that there is either an error in the locality, or that better specimens would show decided differences.

STILIFER ACICULA (*Gould*).

Testa minuta, imperforata, elongato-subulata, acutissima, ad apicem integerrima et lentè distorta, nitidissima, livido-lactea interdum flavescens: spira anfractibus ad duodecim planulatis; suturâ lucidâ: apertura angusta, ovalis; labro simplici, antrorsum arcuato, anticè evoluto; columellâ vix arcuatâ.

Stilifer acicula, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 84. March 1849. Expedition Shells, 54.

SHELL minute, highly polished, thin, vitreous and transparent, elongated, subulate, at tip very acute and slightly distorted, of a tarnished, bluish-white colour, mixed with pale yellow. Whorls numerous, twelve or more, conical or scarcely swelling, opaque, white at the suture, which is well marked, and generally has an accompanying stria. Aperture small, ovate, more than half the length of the last whorl: lip simple, when viewed laterally exhibiting its outline arching forwards, so as to form somewhat of a sinus at the upper angle; column short, slightly arcuate, continued into the lip, which is somewhat everted or effuse at base.

Length three-eighths of an inch; breadth one-tenth of an inch.

Inhabits the skin of *Holothuria*, Feejee Islands. *Drayton*.

A much more delicate species than any one of *Stilifer* or *Eulima*

described. The little *Phasianella stilifera*, Turt. (*Stilifer turtoni*, Brod.) is somewhat like it. *S. subulatus*, from the West Indies, is much less slender.

Figure 246, 246 *a*, front and profile views of the shell, enlarged ; 246 *b*, natural size.

The sketch of an animal taken from Holothuria at Tahiti, evidently a larger and less slender species, is given in outline, merely to afford some notion of its form. It accords with Owen's account of the animal, so far as concerns its rudimentary foot, and its enormously elongated proboscis. It does not appear, from the sketch, whether the whole shell is enveloped in a fleshy mantle or not ; the indications are that it was not.

Figure 247, the animal, with an outline of the shell.

HALIOTIS CRISPATA (Gould).

Testa parva, tenuis, convexa, elongato-ovalis, undulis obliquis angulatis divaricantibus rugata, spiraliter striata, rubida: spira elevata, sub-mediana; foraminibus parvis, circularibus, confertis, ad septenis perviis, extrorsum canaliculatis; intus undulosa, nitida, argentea.

Haliotis crispata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 251. December 1847.

SHELL small, very thin and delicate, of an elongated oval, and more than usually convex form, the surface marked with fine, regular, equal, revolving threads, and with very delicate, branching, oblique, zigzag ripples, which are almost equally conspicuous in the interior. The spire is prominent, of a little less than three whorls, the apex nearly on the median line. The perforations are small, rounded, slightly tubular, numerous and crowded, six or seven of them open ; and external to the series is a deep canal. The colour is bright brick-red or red-lead colour, having between the canal and the margin a few narrow and distant yellowish-white stripes. The interior is brilliant silvery, and somewhat iridescent.

Length an inch and three-eighths; breadth seven-eighths of an inch.

Brought with New Holland shells.

About the size and form of *H. stomatiæ-formis*, Reeve, but distinguished from all others by its crowded angular ripples, arranged somewhat like the colours on *H. ziczac*. No shell approaches it in this respect except the very young of *H. australis*.

Figures 248, 248 a, aperture and back of the shell.

STOMATELLA TUMIDA (*Gould*).

Testa subglobosa, ampullacea, tenuis, nitida, cinereo-olivacea, propè suturam albido et rufo seriatim maculata et lineolis sagittatis vittata, subtus flavescens, sulcis remotis cincta, sulcis basalibus fusco-articulatis: spira anfractibus quatuor tumidis: apertura circularis intus margaritacea; labro acuto, albo; columellâ revolutâ, callo copioso, erecto, albo, striato marginatâ.

Stomatella tumida, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 74. November 1849. Expedition Shells, 51.

SHELL subglobose, thin and light, polished, of an ashy olive-green colour, pale and yellowish beneath, with distant revolving ridges, which are abrupt above and slope downwards: there are six or eight of these on the upper whorl, and eighteen or twenty on the body whorl; about four of the basal ridges are tessellated with bluish-black, and more or less of the others above (four or five conspicuously so) are most delicately veined with white and brown, angular, invaginating spots exhibiting so many delicate bands; near the suture it is usually blotched with alternate white and brown; lines of growth distinct, distant, shallow. Whorls four, forming a prominent spire, broadly inflated. Aperture circular; lip sharp, a little sinuous above, at the junction; columellar edge everted, so as to form a rounded pillar, margined by a thick, white, grooved lunate callus, not closely appressed at the outer edge; interior silvery, and exhibiting the external sulci.

Length an inch and an eighth; breadth three-fourths of an inch; height seven-eighths of an inch.

Purchased at Singapore, by Mr. Rich, and is known to be native at the Molucca Islands.

Distinguished by its globular form, shining surface, peculiar coffee-coloured ground, with delicately painted, feathery ridges, and the large, white, elevated, columellar callus. It accords with the figure in Chemnitz of *Turbo papyracea*, but that shell is described as perfectly smooth. This shell certainly does not belong to the genus *Turbo*.

Figures 249, 249 *a*, 249 *b*, three views of the shell.

STOMATELLA DECOLORATA (*Gould*).

*Testa auriformis, depressa, subperforata, albida, maculis lacteis et labe-
culis sanguineis marmorata, costulis numerosis confertis cincta, striis
minutis ad paginam superiorem interpositis: spira prominula, anfrac-
tibus quatuor planulatis, suturâ profundâ discretis: apertura obliqua,
sub-circularis; columellâ acutâ, supernè reflexiusculâ, areolâ latâ
inornatâ adjunctâ.*

Stomatella decolorata, GOULD; Proceed. Boston Soc. Nat. Hist., iii.
73. November 1848. Expedition Shells, 51.

SHELL uniform, depressed, rather rounded in outline, dead white above, with spots of milk white and blotches of pale sanguineous especially near the suture; whorls four, forming an acute, moderately elevated spire, somewhat crenulated at suture; surface conspicuously grooved, those above the periphery having three or four smaller striæ intervening; beneath somewhat imbricated upwards, and barred in the intervals by the lines of growth, which do not pass over the ridges; one-half the breadth of the base adjoining the columella is plain, without striæ, banded by a raised and milk-white line; a slight reflection of the columella against a minute perforation; aperture transverse, rounded oval, nearly circular; interior porcelain white and shining.

Length seven-eighths of an inch; breadth five-eighths of an inch; height three-eighths of an inch.

Inhabits the island of Mangsi. *Pickering*.

Allied to *S. maculata*, Quoy, but the spire is less elevated, the aperture is more rounded, and above all, it is characterized by the plain, white, lunate area adjacent to the columella.

Figures 250, 250 *a*, aperture and back of the shell; 250 *b*, sculpture, magnified.

NATICA LEWISII (*Gould*).

Testa prægrandis, solidiuscula, conico-globosa, albida, epidermide sordidè stramineo induta, lineis minimis confertissimis, flexuosis cincta: spira anfractibus sex ventricosis posticè valdè constrictis: apertura obovata, ampla, callo copioso albo castaneo-tincto umbilicum modicum simplicem profundum posticè circumambiente, ad anfractum ultimum munita; fauce incarnatâ. Operculum corneum.

Natica Lewisii, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 239. July 1847. Expedition Shells, 49.

SHELL very large, not very ponderous, globose-conic; the spire rather elevated and acute; colour pale fleshy, covered by a thin, ashy epidermis, which is everywhere marked with very delicate, crowded, undulating, revolving lines. Surface somewhat undulated by the stages of growth. Whorls six, moderately convex, somewhat flattened near the suture, the last whorl having a very remarkable broad, well-marked constriction, at about its posterior third, which is continued also about the middle of the posterior whorls. Aperture obovate, broad, having a sharp lip, until it rises on the left margin, when it widens, and presents a rounded edge, terminating in a copious white callus, which seems to flow down about half way around the umbilicus without closing it, and having a furrow running obliquely inward, from the upper edge of the umbilicus; its edges are somewhat tinted with chestnut, and a strong band of callus also fills the upper angle of the aperture. Umbilicus moderately long, deep, nearly round, with a slight encroachment down the right wall. Interior of the aperture shaded with pale flesh-colour. Operculum thin, horny.

Axial diameter four and a half to five inches; transverse diameter four inches.

Inhabits Oregon, at Discovery Harbour, Puget Sound. *Pickering*.

This certainly exceeds in size all other species yet discovered. It is allied to *N. heros*, some specimens of which occasionally approach it in size. It is, however, less globular, and distinguished by the remarkable constriction near the suture. Specimens were brought from the mouth of the Columbia, by Lewis and Clarke, and have been designated by the above name.

Figure 253, vertical view of the shell; 253 *a*, the operculum.

NATICA CAURINA (*Gould*).

Testa parva, solida, levigata, globoso-ellipsoidea, albida, epidermide tenui stramineo induta, vix perforata: spira obtusa, erosa, anfractibus quatuor cum dimidio, ultimo sub-tabulato, anticè subcontracto: apertura parva, semilunaris; columellâ rectâ, posticè callo copioso albo indutâ.

Natica caurina, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 239. July 1847. Expedition Shells, 50.

SHELL small, solid, smooth, of a round-ellipsoid form, of a dead, dirty milk-white colour. Whorls four or five, the upper ones forming a depressed spire, with the apex eroded, and suture linear; the last whorl very large, full posteriorly, and somewhat tabular at the suture; the last whorl is quite as long as broad, and perhaps attenuated at base. The aperture is about two-thirds the length of shell, semilunar; the outer lip sharp, the pillar lip straight, heavily and broadly loaded with callus posteriorly, and regularly narrowing, and yet nearly covering a small umbilical pit at the middle, so as to leave merely a small, linear chink, or none at all.

Axial diameter half an inch; transverse diameter two-fifths of an inch.

Inhabits the Straits of De Fuca, Oregon. *Pickering*.

Nearly the same as *N. impervia*, Phil., from Cape Horn, which has a very depressed spire, and its umbilicus closed by a semicircular callosus. Its form and colour is like *N. immaculata*, Totten., though it is much larger. It is more solid and less globular than *N. Grænlandica*.

Figures 254, 254 *a*, ventral and dorsal views of the shell.

NATICA DILECTA (*Gould*).

Testa parva, globulosa, solida, sub epidermide sordido eburnea, lineolis rubiginosis araneosis scutulata et propè suturam lituris castaneis maculata: spira rotundata, anfractibus quinque ventricosus: apertura semilunaris; labro crasso; columellâ valdè calliferâ, callo anticè et ad funiculum castaneo, et canali transverso ferè diviso; umbilico amplo, funiculo ferè impleto.

Natica dilecta, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 73. November 1848. Expedition Shells, 50.

SHELL small, very solid, nearly globular, polished and shining, covered with a russet-coloured epidermis, under which the shell is ivory white, reticulated with a very minute network of rusty brown or fawn-colour, leaving occasional white patches, and with a series of chestnut-coloured blotches, revolving on all the whorls near the suture. Whorls five, well rounded, a little flattened and appressed posteriorly; suture obovate; the aperture is semicircular, setting off somewhat from the last whorl. The umbilicus is large, but nearly filled by the funiculus, leaving only a sort of exterior canal, which crosses and nearly divides the columella: the outer lip is thick; pillar lip covered with callus, which is copious above, and at the basal point where the pillar meets the lip at a right angle. This point is tinted chestnut-brown, as well as the callus which covers the funiculus. The operculum is undoubtedly bony.

Diameter five-eighths of an inch.

Probably obtained at the mouth of the Rio Negro, Patagonia.

It has a general resemblance in size and form to *N. maroccana*, and the shells from the Mediterranean allied to it; but is more solid, and differs from all in its umbilical channel, which is uncovered externally, and is below the funiculus, and not above it. Its network colouring is peculiar, looking much like that on the pale bands of *Conus ammiralis*. It most nearly resembles a shell which I suppose to be *N. lupinus*, Desh., which has a nearly similar columella, form, and solidity, with a simply banded colouring.

Figures 255, 255 a, front and back view of the shell.

NATICA ALGIDA (*Gould*).

Testa parva, tenuis, globosa, glabra, albido-livescens: spira anfractibus quatuor ventricosis juxta suturam linearem tabulatis, ultimo magno ampullaceo: apertura semilunaris; columellâ arcuatâ: basis umbilico modico spirali funiculato, ad introitum angulato, perforata.

Natica algida, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 73. November 1848. Expedition Shells, 50.

SHELL small, rather thin, globular, smooth, of a pale bluish-white colour. Whorls four, forming a rounded, slightly elevated spire, the last one very capacious, with a narrow shoulder near the suture. Aperture semilunar, outer lip thin; inner margin curved, covered posteriorly by callus, which is not very closely appressed. There is a rather large, open, somewhat spiral umbilical opening, externally margined by an angle, and partially filled by a revolving pillar, on which is an expansion of the callus.

Axial diameter five-eighths of an inch; transverse diameter three-fifths of an inch.

Dead specimens were obtained at Classet, Oregon.

Differs from *N. soluta* principally in its sutural region, and in its umbilical region, in which latter respect it differs from several allied species, such as *N. globosa*, *N. borealis*, &c.

Figures 256, 256 a, ventral and dorsal views of the shell.

NATICA SOLUTA (Gould).

Testa parva, globosa, sordidè alba, striis tenuissimis cincta: spira anfractibus quinque ventricosis, supernè sub-tabulatis; suturâ profundissimâ: apertura semilunaris, angulo postico callo firmato; labro acuto, tenui, ad basim incrassato, subeffuso: columella recta, callosa, post umbilicum parvum profundum dilatata.

Natica soluta, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 239. July 1847. Expedition Shells, 50.

SHELL small, thin, nearly globular, dirty white, smooth, but everywhere decussated by fine lines of growth, and scarcely perceptible revolving lines. Spire rounded conical, of five ventricose whorls, slightly tabular above and divided by a deep-channeled, delicate suture: last whorl slightly narrowed, and produced anteriorly. Aperture semilunar, posteriorly made firm by the angle being filled with callus; outer lip thin and sharp, thickened and rounded at base; columella straight, delicate as it passes the small, deep umbilicus, and spreading out in callus above.

Diameter half an inch.

Probably from the austral coasts of South America.

A small, nearly globular shell, allied to *N. borealis*, Gray, and *N. globosa*, King, but distinguished by its deep-channeled suture.

Figures 257, 257 *a*, front and back view of the shell.

AMPULLACERA BUSBYI (GOULD). *Helix Busbyi*, GRAY; Ann. and Mag. Nat. Hist., vi. 317. REEVE; Conch. Syst., ii. 164, f. 11. PFEIFFER; Monog. Helic. Viv., i. 109.

Concerning this very remarkable shell there is still much doubt. But it is very certain that it is not a *Helix*. It is very difficult to preserve the shell entire, because it is covered with a thick, horny, polished epidermis, which projects beyond the calcareous portion and warps

by exposure to the atmosphere, like the epidermis of the Mytili, breaking at the same time the fragile shell. This would not be the case were the shell designed for exposure to the atmosphere. *Ampullacera fragilis*, as described by Quoy and Gaimard, appears to be allied to this shell; and I venture, for the present, to associate it with that genus. As a further reason, we may add the fact that this, as well as the described species of Ampullacera, are peculiar to New Zealand.

SIGARETUS ANTARCTICUS, (*Couthouy, MS.*)

ANIMAL remarkable for the delicacy and beauty of its coloration. On a deep orange-coloured ground, the back exhibits numerous, small, reticulating lines, so intersecting as to form little parallelograms; these are bordered with white dots, and the intervals covered with larger ones of bright yellow. The under side of the mantle is very broad, and of a delicate rose-colour, margined by a narrow line of dark red, veined with radiating lines. The foot is lemon-coloured, paler along the middle. All the colours of the under side have a semitransparent look. Form of the animal broad-oval, very convex, highest at the anterior third; the mantle extends far beyond the foot, except posteriorly, where the foot projects some distance; it is deeply cleft in front, or rather forms a deep sinus or aquiferous canal to the branchiæ, on the under side, which above appears like a deep sinus or emargination. The head is broad, and capable of great extension, with a transverse cleft below, giving exit to an enormous proboscis, largest at its extremity, with a vertical fissure at tip. Tentacles at each angle of the head, conical, compressed; eyes on a lateral enlargement near the base, very prominent. Foot nearly square in front, with a very deep fissure across; the upper margin thus formed projects a little beyond the side of the foot, in a sort of laciniation; posteriorly, it is narrowed considerably, and projects a little behind the mantle.

SHELL not observed, but presumed to be quite flexible, as when contracted by alcohol the shape is altogether altered.

Length an inch and three-fifths; breadth an inch and one-fifth.

Obtained by Midshipman Elliot among stones, at low tide, Orange Harbour. [J. P. C.]

Figures 259, 259 *a*, 259 *b*, three views of the animal; 259 *c*, head, with the proboscis protruded.

SIGARETUS PRÆTENUIS, (*Couthouy MS.*)

ANIMAL smaller and proportionally narrower than in *S. antarcticus*; the mantle also is narrower, and the anterior cleft slight, making the front heart-shaped. Form heart-shaped, moderately convex, more elevated posteriorly than in front, with fine radiating lines beneath. Head and tentacles much as in the preceding species. Back of a dirty ochreous colour, longitudinally wrinkled, and having a short cinereous pubescence upon it. The foot is rather lighter coloured, with a reddish tint on the upper part; the transverse fissure is less profound than in the preceding species.

Length about an inch and a quarter; breadth four-fifths of an inch.

SHELL not examined, but seems very small, its spire being readily seen on the right side, at the bottom of the cavity back of the head.

Inhabits Orange Harbour. Only a single specimen was obtained.

Figures 260, 260 *a*, 260 *b*, three views of the animal.

RISSEA AMBIGUA (*Gould*).

Testa minuta, albida, imperforata, ovato-subulata, costis longitudinalibus exilibus ad viginti ornata, intervallis spiraliter striatis: spira acuta, anfractibus ad decem planulatis: apertura auriculata, anticè subeffusa; columellâ callosâ, gibbosâ, anticè sinuatâ; labro simplici, incrassato.

Pyramidella ambigua, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 118. May 1849. Expedition Shells, 60.

SHELL minute, imperforate, dingy white, elongated, ovate-lanceolate, or rather subulate, about twenty delicate, longitudinal ribs on each whorl, the interstices marked with numerous, revolving lines: spire

acute, of about ten nearly flat whorls separated by a well-marked suture. Aperture less than one-third the length of the shell, oblique, semi-lunar, with a depression at the lower angle (anteriorly) scarcely amounting to a notch; outer lip thick, not reflexed, though apparently so when viewed in front, polished; pillar margin arcuate, with callus posteriorly, and also a considerable intrusion just above the rostral region, which, ending suddenly, is the principal cause of the apparent notch.

Length of axis one-fourth of an inch; breadth one-tenth of an inch.

Inhabits Clermont Tonnerre, Paumotu Islands. *Couthouy*.

The characters of this little shell are somewhat abnormal. Its size and sculpture would suggest *Truncatella*; its aperture is somewhat like the effuse form of *Eulima*; the form of the aperture is also like *Pyramidella*, with which I at first placed it, though it has no proper plaits, but merely an intrusion of callus with an adjacent sinus in place of them, and in this, is like *Monotigma*. It agrees in all respects with *Rissoa*, except in the effuse base of the aperture.

Figure 261, 261 *a*, front and lateral view of the shell, enlarged; 261 *b*, aperture much enlarged; 261 *c*, natural size.

TORNATELLA BULLATA (*Gould*).

Testa parva, ovata, tenuis, albida, epidermide stramineo fugacissimo induta, spiraliter sulcata, sulcis linearibus ad quinque ordinatim dispositis in singulis anfractibus: spira prominula, turrita; anfractibus quinque tabulatis, ultimo magno, ventricosus, quindecim-sulcato, supernis planulatis; sutura canaliculata: apertura semilunaris; columellâ uniplicatâ, planulatâ.

Tornatella bullata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 251. December 1847.

SHELL small, thin, smooth, whitish, covered with a most delicate straw-coloured epidermis. The whole surface is marked with regularly arranged, deep, linear, revolving grooves, of which there are

about five on the upper whorls, and about sixteen on the principal whorl. In some parts the furrows seem to be crossed by delicate bars. The interspaces are flat. There are five whorls, which have a distinct, square shoulder; the large whorl is tumid, the upper one plane. The aperture is lunate, about three-fifths the length of the shell. The columella, about one-third the length of the aperture, is flat, and divided by a single groove.

Length of axis one-fourth of an inch; breadth one-sixth of an inch.

Dredged off Patagonia.

This little species, like *T. puncto-striata* and *T. venusta*, to which it is allied, has not the ivory surface of most species. It is well characterized by its form and sculpture.

Figures 263, 263 *a*, dorsal and ventral views of the shell, enlarged; 263 *b*, natural size.

TRICHOTROPIS CANCELLATA, HINDS; Proc. Zool. Soc., London, 1843. Zoology of the Voyage of the Sulphur (Mollusca), 39, pl. 11, f. 11, 12.

ANIMAL much as in *Littorina*, *Planaxis*, and *Melania*, but the snout is on a line with the tentacles, and not much protractile. Mouth large and corneous; tongue as usual; no retractile proboscis. Eyes near the outer base of the tentacles; "verge" exposed on the right side, near the tentacle. Foot tumid in front, capable of adhering pretty firmly to glass. Margin of the mantle slightly scalloped to correspond with the ridges of the shell. Colour pale, as though not much exposed to the light. Motion sluggish. (*C. Pickering.*)

The operculum is narrow-ovate, sub-spiral, with the apex dentate.

The shell is twice the size of the specimens figured in the Voyage of the Sulphur, which were obtained from Sitka, while ours were from the Straits of De Fuca, where they are abundant. They were at least an inch in length. The epidermis is bristled with long filaments as in *Triton*. By age the umbilical slit becomes obliterated

and the basal emargination elongated into a decided canal, though the animal has no siphon.

Figure 275, the operculum.

BULLA PARALLELA (*Gould*).

Testa parva, tenuis, cylindracea, lactea, anticè rotundata, posticè conica, imperforata, longitudinaliter minutissimè striata, ad verticem et ad basim striis undulatis decussata: apertura angusta, deorsum dilatata; columellâ callo haud appresso indutâ; labro ultra spiram adscendente, tunc deorsum intorta.

Bulla parallela, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 251. December 1847.

SHELL small, thin, pellucid, milk-white, cylindrical, rounded at base, obtusely conical at summit, imperforate at apex; surface delicately marked with lines of growth, and these are crossed at the lower and upper third of the shell, by somewhat conspicuous, minutely flexuous, revolving lines. The aperture is narrow, widening downwards; lip sharp, rising considerably above the apex of the spire, and at the same time inclining towards it, then turning downwards and entering the aperture by a twisted fold; at base it is rounded, and rises upon the columella in the shape of a thick callus, which is not appressed to the body of the shell.

Length about half an inch; breadth one-fifth of an inch.

Habitat unknown.

Much smaller and thinner than *B. solida*, though striated at the ends like it, and having the same conformation of the lip. Its sides also are parallel and not bulging.

Figures 267, 267 *a*, two views of the shell.

BULLA BIFASCIATA, Martini and Chem., tab. 21, fig. 190, 191; LISTER, Conch., tab. 1056, f. 8. *B. ampulla*, (var.) Lin. and Auct SOWERBY, Thes. Conch., pl. 122, fig. 59.

The form and colouring of this shell is so constant, that I hesitate not to regard it as a distinct species, under the name which it bears in the work of Martini and Chemnitz. It is smaller and more globose than *B. ampulla*, and constantly bears the two dark bands dividing the surface into three nearly equal zones.

It was dredged at the Feejee Islands, in from three to six fathoms water.

ANIMAL nearly colourless above, tinted blue and flesh-colour; form elongated; mantle covering about one-third of the shell; head obtuse, in front bilobed, with tentaculiform appendages at each angle; eyes at base, quite distinct; behind these are two long, lanceolate appendages, reaching back upon the shell, half the length of the animal. The size of the tentacles in the figure would seem to be exaggerated, though the animal of *B. aplustre* is represented by Quoy with two pairs of similar ones.

Figure 264, the animal, with the shell.

BULLA RUBIGINOSA (*Gould*).

Testa B. amygdalo simillima, sed incola valdè differt: ellipsoidea, solidula, cinerascens nigro-nubeculata, sepius ferrugineo deluta.

Bulla rubiginosa, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 107. April 1849.

ANIMAL with the head flat, compressed, bilobed in front, the lobes semicircular, with a deep fissure between, on each side of which, in a small circular depression and rather remote, are the eyes; posteriorly the head is furnished with two thin, prolonged, sub-triangular lobes. The mantle is very narrow, hardly surpassing the edge of the shell. The colour of the body is light ochreous, powdered, as it were, with black. Its motions were sluggish. [J. P. C.]

The general contour of the shell is like that of *Bulla amygdalus*, with which it has doubtless been confounded. The animal, however, is very different. In general, the surface was either eroded or covered

with a rusty coating, as is most commonly the case with all shells found at the mouths of rivers in brackish waters. When perfect, it is of a light shining brown, clouded with black.

Length about an inch and a half.

Obtained near the mouth of the harbour of Rio Janeiro. *Couthouy*.

Figures 266, 266 *a*, two views of the animal, with the shell.

BULLA DIAPHANA (*Couthouy, MS.*)

Testa fragilis, lucida, ventricosa, dilute cornea, transversè striata.

Bulla diaphana, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 91. March 1849.

ANIMAL of a delicate grass-green colour, everywhere minutely dotted with black and cinereous, except the side of the mantle next the shell, which is nearly white. The head is moderately convex, oblong, the part behind the auricles entire, not bilobed, destitute of any lobular appendages; eyes nearly central and approximate. Mantle large, nearly concealing the whole shell when the animal is expanded, and never wholly withdrawn. Foot oval, rather broader posteriorly than in front, where it is separated from the head by a broad and deep fissure. The average length, when crawling, was about one and a half inches.

SHELL very thin, nearly colourless, finely and closely striated all over its surface, quite ventricose, resembling in its general features *B. fusca* and *B. elegans*. [J. P. C.]

Length about three-fourths of an inch.

Drawn up in shrimp-nets near the mouth of the harbour of Rio de Janeiro.

Figures 265, 265 *a*, 265 *b*, three views of the animal, with the shell; 265 *c*, front of the animal in outline; 265 *d*, the shell.

APLYSIA PULMONICA (*Gould*).

A. corpore oblongo, posticè sacciformi, fusco-viridi venis fuscis reticulato: apertura siphonalis parva: caput obtusum, vix bilobatum: tentaculis anticis curtis, auriformibus; tentaculis cervicalibus conicis, acutis, obscure annulatis.

Body oblong, posteriorly sacciform, with a short, distinct prolongation of the foot backwards. Colour bronze-green, coarsely reticulate with dark veins; siphonal aperture small; head obtuse, slightly bilobate; anterior tentacles short, ear-shaped; cervical tentacles acutely conical, faintly annulate.

Length six inches; height two inches.

Obtained at Tutuilla, Samoa Islands. *Couthouy*.

This animal bears a general resemblance to *A. Tongana* of Quoy and Gaimard; but their figure shows the ruffled posterior disk peculiar to the subgenus *Dolabella*, no traces of which are apparent in this species.

Figure 268, the animal.

BURSATELLA LACINULATA (*Couthouy, MS.*)

B. elevata, oblonga, posticè acuminata, virescens confertim nigro-punctata, arbusculis viridibus sparsis ornata: pes ampla, lata; soleâ stramineâ nigro-punctatâ; labrum utrinque in filis tentaculiformis protractum.

Colour pale-green, closely covered with black dots, which give it a bronze hue. Whole body ornamented with little green arborescent or frondescent tufts, irregularly disposed, except around the upper margin of the foot, where they are smaller and form a regular row; viewed in the water these tufted appendages cause the animal to appear as if covered with a delicate moss. The mouth is nearly concealed by its thick, fleshy lips, which are prolonged on each side into a slender

tentaculiform process. Foot large and broad, sole yellow, dotted greenish. Twice as long as broad, elevated, abruptly sloping behind, the foot trailing in a point behind. [J. P. C.]

Length two and a half inches.

Inhabits the harbour of Rio Janeiro. *Couthouy*.

A single specimen found among rocks terminating the beach in front of the lagoon of Peteninga, one of those brackish lakes common along the coast, separated from the sea by a strip of sand, perhaps fifty yards wide, and six feet above high tide. Resembles *A. Savigniana*, Fer., but is distinguished by its broader foot and the filamentous prolongation of the lips, as well as in many of its details. It belongs to the genus *Notarchus* of Cuvier.

Figure 269, the animal, as in motion; 269 *a*, view of the plantar disk.

GENUS STYLOCHEILUS—(GOULD.)

Corpus limaciforme, lanceolatum, retrorsum attenuatum, cirrhigerum; caput liberum, tentaculis quatuor elongatis linearibus plus minusve papillois instructum; os inferior; labro lateraliter in processum subulatum palpiformem dilatato.

Body limaciform, dilated at the sides and delicately attenuated posteriorly, cirrhigerous; head separated from the body by a distinct neck, and furnished with four elongated, linear, distant tentacles, more or less ornamented with papillæ; mouth beneath, the lip dilated laterally into an acutely conical process, like a third pair of tentacles.

Sander Rang, in his remarks on *Aplysia longicauda* of Quoy and Gaimard, says—"These naturalists have represented six tentacles, while in the four individuals preserved, which we have examined, we find only four. For light on this subject, we have inquired of M. Gaudichaud respecting this apparent error. He answered us, that this little animal had three pairs of tentacles; and, to convince us of it, showed two outline figures made from the animal, representing un-

equivocally this singular character." These processes had doubtless become so contracted by immersion in alcohol as to be invisible; but the figures we have now the opportunity of presenting, drawn also from living specimens, and which correspond so well with the figure of *A. longicauda*, leave us no longer in doubt as to the existence of a genus with this characteristic, with at least three species. The papillæ on the mantle are capable of being individually elongated and contracted, as they are in *Cypræa*.

STYLOCHEILUS LINEOLATUS (*Gould*).

Corpus viride, lineis ferrugineis longitudinalibus parallelis contortis, et ocellis inequalibus remotis ornatum; papillis remotis, ramosis; tentaculis anterioribus subulatis, nudis.

ANIMAL elongated, delicately attenuated posteriorly, of a pale grass-green colour, ornamented with longitudinal, parallel, contorted, rusty lines, and scattered ocelli of unequal size. The papillæ of the mantle are branching. The anterior tentacles are short, tapering, and destitute of papillæ.

Length three and a half inches.

Found on a coral reef at Honolulu, Oahu.

Dr. Pickering, who observed this animal, remarks, that the creeping disk is very long, ending in a sharp point. Branchial cavity generally kept pretty wide open; the branchiæ are very large, not covered by a dorsal plate, and coloured above in the same manner as the mantle, and they are inflated as though injected with water. The heart is seen beating on the left side, immediately under the origin of the branchiæ. The vent projects much as in *Doris*. The lines on the surface were more or less concentric, like the striæ in the palms of the hands. Motions quite active.

Though the two figures differ somewhat in their details, I judge them to represent the same species. In the dark green one, the tentacles are shorter, and the cephalic pair are destitute of papillæ, and the

papillæ are branched. In the pale one, the tentacles are longer, more linear, all furnished with papillæ, which are everywhere aculeate. But when we consider the identity of locality, the difficulty of delineating these animals while living, and their power of contracting and modifying parts, I think we may safely and properly regard them as the same. *Aplysia striata*, Quoy, is lineated like this, but has naked, truncated tentacles, and very few cirrhi.

Figure 270, lateral view of the animal; 270 *a*, a dorsal view, with the branchiæ displayed.

STYLOCHEILUS QUERCINUS (*Gould*).

Corpus elongatum, attenuatum, e fusco ferrugineum, longitrorsum rufo-lineatum, papillis elongatis ramosis instructum: tentaculæ prælongæ lineares, truncatæ, papillis acutis armatæ.

Body limaciform, elongated, delicately attenuated; the ground colour slaty, tinted with wood-colour, and longitudinally grained with numerous unequal, rusty lines or folds. Tentacles very long, linear, truncate at tip, and beset with numerous acute papillæ. The papillæ on the body are long and branching, but becoming more and more simple towards the margin and tail. Eyes distinct in front of the cervical tentacles.

Length three and a half inches.

Dredged at Lebuka, Feejee Islands.

The peculiar coloration and graining of this animal are something like that of oak wood.

Figure 271, the animal, as in crawling.

JANTHINA EXIGUA (LAMARCK), Anim. sans Vert., ix. 5. Encycl. Méthodique, pl. 456, f. 2, a, b. SOWERBY, Genera of Shells, f. 2.

ANIMAL nearly colourless, except the anterior portion of the foot, which is a rich ultramarine blue; the proboscis has a fainter shade of the same, communicating its shade to the transparent sheath; its tip is flesh-coloured, and armed with numerous fine bearded setæ, with which it was seen to seize animalcules for food. Tentacles only two, each one having, about one-third from the base on the side next the foot, a short spur, like a second tentacle. Eyes very small, but distinctly seen just behind the base of the tentacles.

Its float is about one and a half diameters of the shell in length, narrow, most elevated near its attachment, but not much elevated anywhere, tapering backwards. Vesicles small, not imbricating, but alternating with each other. The animal did not reconstruct its float when retained under water, but commenced it immediately when raised to the surface. [J. P. C.]

Found in lat. 18° 20' S., long. 132° W., 150 miles from land.

Figure 272, lateral view of the shell containing the animal; 272*a*, buccal barbs, enlarged.

Figure 273 represents the animal of the common *Janthina* (*J. fragilis*), which is unaccompanied by a description, but which is given because it seems to be more lifelike and more in detail than any one hitherto published.

PYRULA DEFORMIS (LAMARCK), Anim. sans Vert., ix. 520. *Purpura abbreviata*, var. KIENER.

ANIMAL small, pale lemon-yellow; foot small, escutcheon-shaped, anterior border a little dilated; head narrow, with the tentacles stout at base, short subulate; eyes nearest the tip; siphon not protruding.

Found at Tutuilla, Samoa Islands.

Figure 276, small variety of the shell, with the animal.

FUSUS GEVERSIANUS (PALLAS), Spic. Zool., pl. 3, fig. 1. *Buccinum*

fimbriatum, MARTYN'S Univ. Conch., pl. 1, f. 6. *Murex Magellanicus*, GMELIN and LAMARCK, Anim. sans Vert., ix. 589.

ANIMAL of a uniform ochreous yellow, somewhat paler on the disk of the foot, which is small, oval, truncated anteriorly, with a deep fissure across. Head distinct, somewhat elongated; mouth inferior at the extremity, the upper edge of the head prolonged over it like a lip, giving it much the appearance of an inverted glove-finger. Tentacles short-conical; eyes on a lateral protuberance about half-way up. [J. P. C.]

Some of the shells have a remarkably bulbous form, and have no conspicuous, longitudinal laminæ, but merely distinct, revolving grooves; and there is every variety between this pattern and the remarkably clathrate surface of the typical form.

Figure 277, a bulbous, smooth shell, with the animal, as in motion; 277 *a*, clathrate shell, with the foot of the animal; 277 *b*, the proboscis in outline.

FUSUS LACINIATUS (MARTYN), Univ. Conch., pl. 42. *Murex lamellosus*, LAMARCK, Anim. sans Vert., ix. 591.

ANIMAL very sluggish; throughout several days' confinement, during which the water was changed twice daily, it never protruded more than is represented in the drawing. The tentacles are conical, compressed, and rather short, with the eyes lateral at the superior third. Foot thick, short and broad, regularly rounded behind, and truncate in front, with a submarginal groove; pale yellow beneath. Siphons short, and like the mantle, of a pale yellow; the margin of the mantle appears destitute of any fringe.

Obtained at Orange Harbour, but appears not to be common.

[J. P. C.]

Figure 278, shell, with the animal, in a crawling position.

FUSUS CRISPUS (Gould).

Testa parva, subrhomboidea, elongata, rudis, cinerea, plicis laminosis octo variciformibus e striis laxis incrementalibus compositis instructa, et liris obtusis cincta: spira acuto-conica, anfractibus septem ad octo convexis, posticè plus minusve angulatis, ultimo ventricoso, trientes duos longitudinis testæ adequante, antrorsum in rostrum acutum subitò attenuato: apertura rotundato-ovata; labro semicirculari, crenulato; columellâ rectiusculâ.

Fusus crispus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 141. May 1849. Expedition Shells, 64.

ANIMAL of a clear, pale yellowish colour. Head small, short, and depressed, never apparently extended beyond the foot, which is elongated, oval posteriorly, and nearly square with a faint submarginal fissure in front. Tentacles rather long, slender and subulate, with the eyes on a very slight, lateral enlargement at their upper third. Siphon pale yellow, dotted white, rarely protruded beyond the canal.

Operculum unguiculate, thin, horny, yellowish at margin, brown at apex, which is acute, somewhat lateral; striæ of increment rather coarse, somewhat imbricated.

SHELL fusiform-turreted, of an ashy colour. Volutions seven or eight, convex and slightly angular, longitudinally traversed by eight or nine prominent, subangular varices, and by as many as fourteen close, elevated striæ, with broader intervening sulci on the last volution, which constitutes half the entire shell, and from three to five on the others. These striæ or costæ are traversed by close and fine incremental striæ, giving them an imbricated, and the sulci a reticulate aspect. Aperture oval, right lip slightly evasive and feebly furrowed within; columella arcuated superiorly, and inclining rather suddenly to the left, a short distance above the canal, which is short, straight, and feebly recurved: within polished, purplish. [J. P. C.]

Length nearly an inch; breadth half an inch.

Dredged at Orange Harbour, in sixteen fathoms water.

This species, from its variciform plaits, might be regarded as a *Murex*, were it not for its rostrum, and its animal. The form varies greatly, as well as the degree of angularity of the whorls; but the peculiar lax arrangement of the stages of growth, especially where they form the varices, allows of no mistake.

The animal is very timid, remaining for hours displaying only a small portion of the foot; and when fully protruded the head never advanced beyond the foot.

Figure 279, a large specimen, with the animal, as in motion; 279 *a*, a slender shell, with the plantar disk of the animal, enlarged; 279 *b*, dorsal view of a curious angular variety; 279 *c*, the operculum.

FUSUS DECOLOR (PHILIPPI), Abbild. der neuen oder wenig. bekannt. Conchylien, pl. 3, fig. 3.

ANIMAL pale straw-colour, flecked with white spots on the tentacles and sides; foot short, square in front, with a deep, transverse, sub-marginal furrow; tentacles broad at base, eyes near their lower third, above which they taper to a point; siphon hardly protrudes beyond the shell.

This animal was found at Orange Harbour adhering to a *Mytilus*, through which it had drilled a hole, about one-twelfth of an inch in diameter, and with its proboscis extended nearly an inch, was leisurely preying on the animal within, and which it had already half devoured. [J. P. C.]

Figure 280, shell, with the animal, as in motion.

FUSUS PLUMBEUS (PHILIPPI), Abbild. der neuen oder wenig. bekannt. Conchylien, pl. 1, fig. 3.

The animal has the whole body of a clear, pale yellow, except the tentacles, which are colourless, with a longitudinal, dull-brown line; the siphon has a faint yellow tinge, as has also the mantle, which has its margin undulating and delicately fimbriated with short, fine,

crowded cirrhi of a delicate purple colour. Head large and thick, proboscidiiform, with the mouth just under its upper edge. Tentacles short, thick and conical, with the eyes on a slight lateral enlargement, about midway of their length. Foot short, oval, truncate anteriorly, with a very distinct, transverse, marginal furrow; colour clear yellow anteriorly, with a slaty tint posteriorly.

Operculum thin, semitransparent, brown, slender, unguiform; apex terminal, incremental lines distinct, every fourth or fifth stria coarser than the rest.

The animal secretes abundantly a sap-green viscous fluid. [J. P. C.]

Figure 281, shell, with the animal; 281 *a*, ventral view of a small shell.

FUSUS LIRATUS (*Couthouy MS.*)

Testa parva, solida, ovato-fusiformis, straminea, longitudinaliter plicis angularibus instructa et striis profundis cincta; spira brevis, conica; anfractibus septem, ventricosis posticè angulatis, ultimo trientes duos longitudinis testæ adequante, antrosum in rostrum tenue contortum subito contracto: apertura angusta, ovata, in canalem obducta; columellâ politâ, contortâ, albâ.

Fusus liratus, COUTHOUY MS.; Proceed. Boston Soc. Nat. Hist., iii. 141. May 1849. Expedition Shells, 64.

ANIMAL uniform pale yellow; tentacles very broad at base, short subulate, compressed; eyes on a lateral enlargement at their lower third; foot oval, truncate anteriorly, always extended so as to conceal the mouth, the only portion of the head visible during crawling being the tentacles. Operculum unguiculate, thin, pale yellow, increment very slow, the striæ being scarcely visible.

SHELL fusiform, turreted, polished, yellowish white, with traces of a thin epidermis. Spire acute, whorls seven, slightly swelling, the last about two-thirds the whole length of the shell, suddenly contracted at its anterior third; all the volutions are marked by prominent,

close-set, angular longitudinal ridges, to the number of twenty on the last whorl, and also by deep-cut revolving striæ between the ridges, most conspicuous near the beak as the ridges begin to disappear. Aperture oval, prolonged into a moderate-sized canal; lip simple, bordered by the last angular ridge, sub-arcuate in the middle; columella white, with a purplish callus extending from it upon the body of the shell. Interior milk white, with a purplish clouding near the lip. [J. P. C.]

Length three-fourths of an inch; breadth three-eighths of an inch.

Dredged in Orange Harbour from fifteen fathoms.

The prominent trigonal ribs, cut by the deep, somewhat distant revolving lines, with its slender rostrum, are characteristic of this species. It resembles *Buccinum cancellarioides*, Reeve.

Figure 282, shell, with the animal, as in motion; and 282 *a*, locomotive disk, enlarged; 282 *b*, shell, natural size.

The six preceding species belong to a group which is peculiar to the southern extremity of America. They have a simple leaden or slaty colour, a short buccinoid form, but with a canal like *Fusus*, instead of a siphonal notch; the surface is sometimes decussated, but is oftener smooth or with occasional sharp, longitudinal lamellæ, and in some species these lamellæ are very numerous, so as to appear like *Murex*. The animal is small, sluggish, and colourless or pale yellow, with a delicate extensile proboscis and short conical tentacles, having the eyes about the middle of their length. The operculum is like *Fusus*. Somewhat similar forms are found in corresponding northern latitudes, as in *Fusus Bamffius*, *F. ventricosus*, *lamellosus*, &c.

FUSUS INCISUS (Gould).

Testa elongato-ovata, livido-cinerea, striis profundis volventibus saturatioribus incisa: spira conica, anfractibus septem convexis, apicalibus undulatis, ultimo trientes duos longitudinis testæ; rostro brevi, vix recurvo: apertura dimidiam longitudinis testæ adequante, angusta, subovalis; labro arcuato, acuto, crenulato; columellâ rectiusculâ, lævi, subcontortâ, purpurascente: faux livido-fusca, sulcata.

Fusus incisus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 141. May 1849. Expedition Shells, 64.

SHELL of medium size and moderate thickness, of an elongated ovate form, of a cinereous brown colour, everywhere encircled with narrow, deeply impressed striæ of a more decided brown colour than the interspaces, about ten on the penultimate whorl. The apical whorls have also eight or nine longitudinal undulations. Whorls six or seven, convex, the last two-thirds the length of the shell, tapering about equally each way; siphonal beak short, a little recurved. Aperture one-half the length of the shell, narrow, sub-oval; outer lip regularly arcuate, crenulated by the impressed lines, and deeply sulcate within; pillar lip nearly straight, a little contorted, smooth, purplish-brown; whole interior livid brown.

Length of axis an inch and three-fourths; breadth seven-eighths of an inch.

Habitat uncertain; probably New Zealand.

This buccinoid species should perhaps be grouped with the genus *Polia* of Gray. It has no remarkable characters except its dingy livid brown colour, and the deep cut revolving lines.

Figures 283, 283 *a*, two views of the shell.

FUSUS FIDICULA (*Gould*).

Testa parva, tenuis, albida, longitudinaliter lamelloso-costata, costis viginti-quatuor, striis volventibus ad octo decussatis: spira conica, turrita; anfractibus septem tabulatis, ultimo in rostro brevi subitò attenuato: apertura angusta, dimidiam longitudinis testæ haud æquans, posticè angulata; labro acuto, crenulato; columellâ posticè arcuatâ, albâ, politâ.

Fusus fidicula, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 142. May 1849. Expedition Shells, 64.

SHELL small, thin, dirty white, turreted, short fusiform. Surface

sculptured with delicate, regular, obtuse, longitudinal rib-folds, about twenty-four on the last whorl, on the middle of which they disappear, decussated by more crowded, delicate grooves, a little undulating, about eight on the penultimate whorl, cutting the longitudinal ribs, and extending to the origin of the beak. Whorls seven, angular, forming a broad shoulder at the suture, which is well impressed, the last one three-fifths the length of the shell, abruptly forming a short, nearly direct beak. Aperture less than one-half the length of the shell, narrow; lip angular posteriorly, gently arcuate, sharp, and delicately crimped by the striæ; pillar arched retrally, then straight, smoothly rounded, white; interior white.

Length of axis nine-twentieths of an inch; breadth equal to half the length.

Inhabits Puget Sound, Oregon.

The counterpart of *F. turricula*, from some varieties of which it would not at first be distinguished; but it is smaller, more solid; the longitudinal ribs less lamellar, and more decidedly cut by the revolving lines, which are also less numerous.

Figures 284, 284 a, two views of the shell, enlarged.

FUSUS ORPHEUS (*Gould*).

Testa parva, elongata, cinerea: spira turrita, anfractibus sex superne angulatis, lamellis acutis longitudinalibus muricatis, et filis transversis cinctis; anfractu ultimo posticè ventricosò, antrorsum in rostrum vix reflexum attenuato: apertura elliptica, dimidiam longitudinis testæ, posticè angulata; labro acuto; columellâ anticè intrudente; fauce carnicolori.

Fusus orpheus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 142. May 1849. Expedition Shells, 65.

SHELL minute, fusiform, thin, elongated, turreted, cinereous, with numerous longitudinal, lamellar, sharp, muricated ridges, thirteen on the last whorl, angular near the suture, crossed by rounded, raised threads of considerable size, which commence gradually in front of a

rib, and terminate on the succeeding one, two or three on the upper whorls, five or six on the last, neither set continued upon the beak. Whorls six, with a broad shoulder near the suture, angular, the last two-thirds the length of the shell, ventricose above, the lower half terminating in a slender beak, a little recurved. Aperture half the length of the shell, elliptical; lip angular posteriorly, a little everted, sharp and simple; pillar with a slight intrusion at the commencement of the canal; interior pale flesh-colour.

Length half an inch; breadth one-fifth of an inch.

Inhabits Puget Sound, Oregon. *C. Pickering*.

More slender, the beak longer, the longitudinal bars less numerous and more lamellar than in *F. fidicula*; in form it is more like *F. bamffius*.

Figures 285, 285 *a*, two views of the shell, enlarged.

FUSUS SUBLUTUS (*Gould*).

Testa parva, tenuis, elongata, pallida vel ad basim et ad suturam livida, longitudinaliter costata, costis ad duodecim erectis, obtusis, ad suturam haud attigentibus, sed secundum rostrum productis: spira acuto-conica, anfractibus septem ad octo convexis, apicalibus levibus, alteris minutissimè decussatis, ultimo sub-globoso dimidiam testæ longitudinis adequante: apertura angusta, posticè angulata; labro posticè arcuato; fauce castaneâ, albo-fasciatâ.

Fusus sublutus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 142. May 1849. Expedition Shells, 65.

SHELL small, thin, elongated, turreted, livid at base and sutures, the central portion of each whorl pale cinereous when dry, with longitudinal, erect, obtuse ribs, not quite attaining the suture above, but extending to the beak, twelve on the last whorl; interspaces about equally broad, very minutely striated with lines of increment, and also by evanescent, microscopic, epidermal, transverse lines. Spire acutely conical, whorls seven or eight, apical ones smooth, convex,

suture well defined, the last whorl half the length of the shell, sub-globose; beak short and buccinoid; aperture one-third the length of the shell, narrow; lip angular retrally, regularly arcuate; inner lip arched retrally, smooth; tip of beak and interior dark chestnut, with a narrow, white fascia.

Length two-fifths of an inch; breadth three-twelfths of an inch.

The last whorl and beak are unusually short, with much the aspect of a *Mangelia*. The colouring of the aperture is very decided, while the surface looks dead and chalky.

Figures 286, 286 *a*, two views of the shell, somewhat enlarged.

MUREX (Trophon) FRUTICOSUS (*Gould*).

Testa parva, tenuis, subrhomboidea, straminea: spira anfractibus quinque ad sex angulatis, supernè concavo-declivibus, serie mediani spinarum armatis, spinis ad sex tubulosis, sub-furcatis, recurvo-adscendentibus; anfractu ultimo series tres spinarum lamellis longitudinalibus conjunctarum gerente: apertura ovato-trigona, dimidiam longitudinis testæ adequans; rostro brevi, dextrorsum deflecto.

Murex (Trophon) *fruticosus*, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 143. May 1849. Expedition Shells, 65.

SHELL small, thin, straw-coloured, destitute of sculpture, short rhomboidal-fusiform. Whorls five or six, angular, the posterior portion concavely sloped, the upper ones armed with a single median series of long, slender, recurved and ascendent tubular spines, about six in number; the body whorl with two series, the lowest of which is smallest; these spines are longitudinally connected by a delicate lamellar varix, and are, as it were, forked by a minute supplementary rusty spine at their bases; another series surrounds the beak. Aperture half the length of the shell, triangular-ovate; pillar smooth, undulate at the origin of the canal; beak short, delicate, strongly flexed to the right.

Length three-fourths of an inch; breadth half an inch.

This shell has the form, size, and armature of *Murex noduliferus*, Sowerby, which is, however, described as being "elevately transversely striated," and with a very short canal.

Figures 287, 287 *a*, dorsal and ventral view of the shell.

MONOCEROS IMBRICATUM (LAMARCK), Anim. sans Vert., x. 118. Encyc. Meth., pl. 396, f. 1, a, b. REEVE; Conch. Icon., f. 10. *Buccinum calcar*, MARTYNS; Univ. Conch., pl. 50. *Monoceros breve*, SOWERBY; Genera, f. 2.

ANIMAL dirty ochreous yellow throughout; foot semi-elliptical, rounded behind, not dilated at anterior angles, and ordinarily advancing beyond the mouth; head with a short neck, bifurcating into two stout subulate tentacles, with the eyes near their tips; mantle folded around the tooth so as to appear perforated; siphon slightly protruded.

Obtained at Orange Harbour, in crevices of rocks at half-tide. The short variety, named *M. breve* by Sowerby, is merely the shorter formed female of Lamarck's *M. imbricatum*. [J. P. C.]

Figure 288, shell, with the animal as in motion; 288 *a*, the under surface of the foot.

TURBINELLA CORNIGERA (LAMARCK), Anim. sans Vert., ix. 380. QUOY and GAIMARD; Voy. de l'Astrol., pl. 35, figs. 24-26. KIENER; Iconog., pl. 1; &c.

ANIMAL pale, mottled above with violet; locomotive disk salmon-coloured, more yellowish anteriorly, as are also the mantle and tentacles; head concealed, the foot advancing before it: tentacles very long and divergent, with the eyes on a bulbous expansion near their tips. Operculum chestnut-coloured.

The figure in the Voyage of the Astrolabe, represents the animal as deep green, and the foot as ash-coloured. The shell is borne aloft by the animal, when moving, in a very peculiar manner.

Figure 290, shell, with the animal as in crawling; 290 *a*, disk of the foot.

TURBINELLA AMPLUSTRE (KIENER); Iconog. &c., pl. 20, f. 2. *Buccinum amplustre*, MARTYNS; Univ. Conch., pl. 3. *Murex amplustre*, CHEMNITZ; Conch., pl. 191, f. 1841.

ANIMAL with the head small, compressed; tentacles short, robust, cylindrical, with the eyes on the summit of an enlargement about midway from base. Siphon sub-pyramidal, not dilated at tip. Foot oblong, with a transverse fissure anteriorly, advancing so as to conceal nearly all the head while crawling. Colour dark maroon-red, the mantle somewhat paler, and the body sparsely dotted white; foot beneath, clear cherry-red, paler at the centre. Operculum dark coloured, unguiform.

The motions of the animal are sluggish, and when at rest the foot assumes nearly a square form. [J. P. C.]

Found alive at Honden Island, Paumotu Group.

Figure 289, the animal, with an outline of the shell.

TURBINELLA ARMATA (BRODERIP), Proceed. Zool. Soc., 1833, p. 7. REEVE; Conch. Icon., pl. 5, f. 29.

ANIMAL above pale flesh-colour, finely mottled with purplish; siphon and locomotive disk salmon-coloured; eyes on a bulbous expansion near tip of tentacles. Operculum yellowish. Shell not carried in so elevated an attitude as in *T. cornigera*.

Found at Honden Island, Paumotu Group. *Couthouy*.

Figure 291, the animal, with the shell, as when crawling.

The animals of *Turbinella*, so far as known, are more or less red, and in some of them the locomotive disk is intensely red. So remarkable is this, that we may almost regard it as a generic character.

All of them have a quadrangular outline of the foot, when contracted, and all have long, stout tentacles, with the eyes near their tips, above which the tentacles terminate in a fine point.

TRITON VARIEGATUM (LAMARCK), Anim. sans Vert., ix. 623. KIENER; Iconog., pl. 2. *Murex tritonis*, LIN.

ANIMAL gamboge-yellow, mottled with blotches of orange; tentacles with two black and two yellow rings near the extremity, the terminal and middle rings being yellow; eyes at the lower third of the tentacles; siphon cream-coloured, tinted orange, without blotches; male organ exposed, simple, sword-pointed.

Obtained at Tutuilla, Samoa Islands. It was first met with at Aratika, one of the Western Paumotus.

The fact that the animals of this species, as well as of the two allied species, *T. nodiferum* and *T. australe*, are less brilliantly coloured than the animals of all other species of the genus, and are destitute of ocelli, lunules, or dots, has been noticed by other observers. These circumstances, together with the great disparity in the size of the shells and the number of their varices in the two groups, would indicate an absolute separation; but we are not yet possessed of essential details sufficient to institute a new genus. The operculum in the first group has the nucleus subcentral, while in the second group it is nearly terminal, as in *Murex*.

Figure 292, the animal as in motion.

TRITON TUBEROSUM (LAMARCK), Anim. sans Vert., ix. 635. QUOY and GAIMARD; Voy. de l'Astrol., pl. 40, f. 18.

The colour of the animal, as given by Mr. Drayton, is quite different from that represented in the Zoology of the Astrolabe, where the ground colour is olive, and the siphon the same as that of the body.

Found at Lebuka, Feejee Islands.

Figure 295, the animal, with the shell in outline.

I am satisfied that two species have been confounded under the above name. The true *T. tuberosum*, is that figured by Lister and Martini, and is a West Indian species. It is short, gibbous, and decidedly waved and nodulous upon the back, with a short rostrum. The other is a Pacific shell, and is figured by Rumphius and Quoy, and by Reeve, as a variety. It is more elongated, with a rostrum of nearly double length, the back is rather wrinkled than nodulous, and the peculiar woven surface, which has obtained for it the name of "bed-tick" shell, among the Dutch, is strongly marked. It has a pale band, always seen by transmitted light within the aperture, and generally well-marked externally also; while the West India specimens seem to be destitute of it, and acquire a much greater amount of callus on the margins. I would propose for the elongated Pacific variety (which is found from the Sandwich to the Feejee Islands, and thence to the Moluccas), the name *T. productum*.

TRITON ANUS (LAMARCK), *Encycl. Meth.*, pl. 413, f. 3. *Anim. sans Vert.*, ix. 636. QUOY and GAIMARD; *Voy. de l'Astrol.*, pl. 40, f. 6-10. *Murex anus*, LIN., &c.

The locomotive disk of the animal is ornamented with large, pustular spots, with the interstices orange; the anterior edge is tessellated orange and cream-colour; the tentacles are annulate with orange; the sides have similar markings, but much paler.

Obtained at Lebuka, Feejee Islands.

Figure 293, the locomotive disk of the animal, which, on comparison, will be found to vary very considerably from that given in the *Zoology of the Astrolabe*.

TRITON DISTORTUM (SCHUBERT and WAGNER), *Suppl. to Mart. and Chemn.*, pl. 231, f. 4074. LAMARCK; *Anim. sans Vert.*, ix. 645. KIENER; *Iconog.*, pl. 17, f. 2.

ANIMAL of a very pale, fleshy tint; head somewhat fawn-coloured, and tentacles annulate with the same. Foot small and short; head protruding; siphon rather long.

Obtained at the Paumotu Islands.

Figure 294, ventral view of the shell, with the animal ; 294 *a*, profile view of the animal.

TRITON CANCELLATUM (LAMARCK), Encycl. Meth., pl. 415, f. 1. Anim. sans Vert., ix. 638. KIENER; Iconog., pl. 16, f. 1. *Murex Magellanicus*, CHEMNITZ; Conch., tab. 164, f. 1570.

ANIMAL with the head prolonged, proboscidiiform ; mouth transverse, under the extremity of the head ; tentacles long, robust, compressed, obtuse at the point ; eyes small, on an enlargement of the tentacles at their lower fourth. Foot oblong, rounded posteriorly, with a sub-marginal fissure anteriorly, beneath pale flesh-colour. Body pale rose-coloured, clouded with purple, darker at the extremities, tips of tentacles white. Siphon short, violet-coloured, as is the border of the mantle, but the rest of the mantle is pale flesh-coloured, with short, close-set cirrhi fringing its edge.

Another specimen is described as of a uniform, pale orange-colour ; tentacles clear yellow beneath and at base ; foot pale yellow, deepening into orange towards the margin. Tentacles rather slender, with the ocular pedicles less developed. Male organ situated on the neck behind the right tentacle ; pale flesh-colour, cylindrically compressed, with an elbow at the middle, and pierced by a hole on its lower side. [J. P. C.]

These two forms prove to be respectively the male and female of the same species. It is, therefore, very variable in the proportions of the shell, and in the colours of the animal ; and it seems to differ both from the true Tritons of the tropics, and from the Buccinums of the northern temperate and frigid regions. This, with the species of Cape Horn regarded as of the genus *Fusus*, will ultimately be separated as a distinct genus.

Figure 298, shell, with the animal as in motion, female form ; 298 *a*, male form ; 298 *b*, the male organ ; 298 *c*, plantar disk of the foot.

TRITON OREGONENSE (JAY), Ann. Lyc. Nat. Hist., N. York, iv. 165, pl. 11, f. 2. *Fusus Oregonensis*, REEVE; Conch. Icon., pl. 16, f. 61 *a*, 61 *b*. *Fusus cancellatus*, REEVE; op. cit., pl. 16, f. 62.

ANIMAL with a very small foot; colour mottled brown, on a pale ground; sexes separate; male organ extremely large. *Pickering*.

The two figures of Mr. Reeve represented the young and adult of the same shell, as is fully shown by the specimens collected by the Expedition. Nor is this shell identical with *T. cancellatum*, Lamarck, as quoted by Mr. Reeve. It was obtained at Puget Sound, and would seem to be common much farther along the coast to the northwest. It is quite remarkable for the very long epidermal fringe, even on old specimens, which are found five inches in length.

RANELLA BUFONIA (GMELIN), LAMARCK, *Encycl. Meth.*, pl. 412, f. 1, a, b. *Anim. sans Vert.*, ix. 547. KIENER; *Iconog.*, pl. 7, f. 1.

ANIMAL cream-coloured, with a few sub-marginal, slate-coloured mottlings, covered with small ocelli, each of which has a vermilion dot. Eyes near the tips of the tentacles, which are very slender. A very large proboscis may be protruded from the mouth.

Found at Gardner's Island, Paumotu Group. *Couthouy*.

Figure 299, animal, with an outline of the shell.

RANELLA GYRINUS (LIN.), DESHAYES. *Murex gyrinus*, LIN., BORN, &c. *Ranella ranina*, LAMARCK; *Anim. sans Vert.*, ix. 549, &c.

ANIMAL pale wood-colour, mottled with transverse dashes of reddish-brown.

Found at Tutuilla, Samoa Islands.

Figure 300, animal as in crawling; 300 *a*, plantar disk.

RANELLA VEXILLUM (SOWERBY), *Conch. Illust.*, pl. 1, f. 3. LAMARCK; *Anim. sans Vert.*, ix. 554.

ANIMAL umber-coloured, darkest on the neck, spotted irregularly with white and orange; lateral margin of the foot bordered bright yel-

low, just above which is a submarginal, blackish line. Foot oblong, rounded behind, and with a transverse submarginal furrow in front; colour of the disk pale fleshy tint, passing into yellow at the margin. Head prolonged, narrow; with a cup-shaped extremity, within which is the vertical aperture of the mouth, surrounded by the true lips. Tentacles elongate, compressed, obtuse, yellowish-brown at base and summit, with a dark spot between the eyes and tip; eyes on an enlargement at their lower third. Siphon short, slightly protruding. [J. P. C.]

Found at Orange Harbour, Tierra del Fuego.

Figure 301, the animal, with the shell, as in motion; 301 *a*, disk of the foot; 301 *b*, animal of the variety.

RANELLA VENTRICOSA (BRODERIP), Proceed. Zool. Soc. Lond., 1832, 178. DESHAYES; ed. LAM. An. sans Vert., ix. 555. KIENER, SOWERBY, &c.

ANIMAL ochreous, marbled with bronze-green; plantar surface paler, slightly mottled. Siphon large, widely expanded at the extremity, which is not truncate. Eyes about the middle of the tentacles, the terminal portion of the tentacles annulated with white at the middle and tip. From the mouth an enormous trompe, nearly as long as the foot, is protruded, which is trumpet-shaped at its extremity, within which is a finger-like process, through which the canal opens. Verge enormous. [J. P. C.]

The animal is more like that of some *Purpuræ*, than like that of true *Ranella*. It is in all respects like that of *P. chocolatta*, and the shells have the same posterior, pleurotomoid emargination of the lip, the broad-spread siphon, and the same form of tentacles, and the mouth is vertical, situated at the bottom of a cup formed by the lip of the proboscis, the upper portion of which may be extended like a hood. The tentacles of the latter species are very badly represented in the Voyage of the Bonite.

Figure 302, the animal, as in motion, with the shell in outline; 302 *a*, the verge in outline.

PURPURA OSTRINA (*Gould*).

Testa parva, solida, rudis rotundato-ovata, patula, exalbida, purpurascens, interdum fasciis geminatis rubidis cincta: spira brevis, conica, anfractibus quatuor vel quinque obtusè angulatis, convexis; ultimo amplissimo, ventricosus: apertura rotundato-ovalis, livido-tincta; labro simplici, patente; columellâ excavato-planulatâ; sinu siphonali angusto, minimè profundo, brevi.

SHELL small, solid, broad-ovate, purplish, banded with brown lines, generally in pairs, faintly marked with the lines of growth, and sometimes with obtuse revolving ribs. Whorls four or five, obtusely angular posteriorly, convex, the last comprising most of the shell, very broad-ovate. Aperture large, patulous, oval; outer lip expanding, smooth, simple; pillar broadly flattened, regularly arcuate, chestnut-coloured; aperture livid chestnut, paler near lip.

Length nearly one inch; breadth three-fifths of an inch.

Obtained at Killimook, Oregon.

One of the lapilloid species, but distinguished by its somewhat smooth surface, its coloration, and more especially by its peculiarly large and patulous aperture and flattened columella.

Figure 310, ventral view of the shell; 310 *a*, dorsal view of a faintly girdled specimen.

PURPURA TÆNIATA (POWIS), *Proceed. Zool. Soc., Lond.* 1835, 96. *Buccinum tæniatum*, REEVE; *Conch. Icon.*, pl. 10, f. 78.

ANIMAL with the head, lower part of tentacles and siphon, and anterior edge of the foot, a very rich purplish-brown; tentacles rather stout, compressed horizontally, eyes at the superior third, above which the tentacles are colourless and taper to the extremity; mantle finely incised at the edge; foot cream-coloured, with paler veins, and a longitudinal median furrow. Operculum large, long, oval, reddish-brown, arranged in nearly parallel elements. [J. P. C.]

The animal is extremely sluggish and timid. It in all respects resembles the animal of *Purpura*, except that the foot is bilobate in front, and somewhat attenuated posteriorly. [J. P. C.]

Found at Honden Island, Paumotu Group.

Figure 309, the animal, with the shell, viewed from beneath; 309 *a*, operculum.

PURPURA ARMIGERA (LAMARCK), Anim. sans Vert., x. 73. REEVE; Conch. Icon., pl. 6, f. 27.

A variety of this shell with three or four rows of large conical or pyramidal protuberances, was found on the reefs at Raraka, Honden, King's and Carlshoff Islands, Paumotu Group.

ANIMAL with the body umber-coloured, paler towards the neck and veined with dark lines, so as to give it a tessellated appearance. Siphon large and long, ash-coloured above, paler beneath; tentacles variegated pale-brown and cinereous as far as the eyes, which are near the extremities, above which is a band of umber, and colourless tip. Foot distinctly auriculate, pale ochreous, the surface reticulated with white veins, and finely incised at the margin; mantle pale ochreous, mottled with cinereous and margined black, with indentations corresponding to those of the lip of the shell. Operculum chestnut-brown, darker at centre, elements loosely attached.

Movements of the animal very active, the two halves of the foot advancing alternately.

PURPURA SCOBINA (QUOY and GAIM.), Voy. de l'Astrol., pl. 38, f. 12, 13. KIENER; Iconog., pl. 35, f. 83. DESHAYES; ed. Anim. sans Vert., x. 113.

SHELL instead of being girded with one or two nodulous carinæ, with the laminæ in the intervals, as if raised up by the oblique prick of a pin, thus making a rasp-like surface, is sometimes found divested

of all these, and the only variation of the surface is a series of zones of dirty brown and dead yellowish-white; but the aperture is always of the same chocolate-colour, and the outer lip always has a cream-coloured margin.

Inhabits New Zealand.

PURPURA SUCCINCTA (MARTYNS), LAMARCK; Anim. sans Vert., x. 63. *Buccinum orbita*, CHEMN.; tab. 154, f. 1471-72. *Purpura orbita*, SOWERBY; Genera, f. 2.

ANIMAL above deep-orange, shaded with dusky; foot beneath, pale cream-colour; head and tentacles large, pale, with transverse crescentic lineations; siphon pale, tipped and margined red.

Figure 1 of Plate 31, of the Voyage of the Astrolabe, is probably intended for the same species, but the colour is there represented of a uniform dusky brown.

PURPURA ELONGATA (BLAINVILLE), Nouv. Ann. du Mus., i. 221, pl. 10, f. 11. *Purpura fenestrata*, QUOY and GAIM.; Voy. de l'Astrol., pl. 37, f. 15, 16. DESHAYES; in Anim. sans Vert., x. 90.

ANIMAL pea-green, bedewed with grass-green points, darkest above, but not so distinctly pointed; tentacles proportionally long.

Found at Metia or Aurora Island, Paumotu Group.

Figure 304, locomotive surface of the animal; 304 *a*, animal, with the shell, as in motion.

PURPURA VIOLACEA (KIENER), Iconog., pl. 19, f. 57. *Pyrula neritoidea*, LAMARCK. *Purpura neritoidea*, QUOY and GAIM.; Voy. de l'Astrol., pl. 38, f. 22-24. Anim. sans Vert. ix. 519.

ANIMAL above bright reddish-violet, the mantle coloured like the aperture of the shell; surface of the foot, siphon and tentacles cream-

coloured, faintly tinted violet; tentacles very large, the eyes large and nearest the tips.

Obtained at the Feejee Islands.

Figure 306, foot of the animal, with an outline of the shell.

RICINULA TUBERCULATA (BLAINVILLE), *Nouv. Ann. du Mus.*, pl. 9, f. 3. REEVE; *Conch. Icon.*, pl. 2, f. 11.

ANIMAL deep grass-green, with the mantle, locomotive disk, tentacles and siphon light sea-green finely dotted with white; foot narrow, elongated, slightly auriculate in front, with a nearly colourless longitudinal furrow; eyes near the upper third of the tentacles, hardly perceptible, above which the tentacles are colourless; siphon somewhat dilated at extremity. In motion, the lateral halves of the disk seemed to be advanced alternately.

Found abundantly at Honden Island and Clermont Tonnere, Pautotu Islands. [J. P. C.]

RICINULA HORRIDA (LAMARCK), *Anim. sans Vert.*, x. 47. REEVE; *Conch. Icon.*, pl. 1, f. 3.

The animal of a variety common at Clermont Tonnere, differs a little from that figured in the Voyage of the Astrolabe. The foot is pale green, passing into yellowish anteriorly, sprinkled with white dots, and deep grass-green at the sides; edge apparently crenulate. Tentacles white, except a ring of brown above the eyes; siphon dull green, mottled purple; mantle purple, mottled white; edges sinuous. Operculum dark chestnut-colour, projecting a little beyond the foot.

[J. P. C.]

RICINULA ARACHNOIDES (LAMARCK), *Anim. sans Vert.*, x. 49. REEVE; *Conch. Icon.*, f. 5.

ANIMAL with a mottled edging of deep grass-green, nearly vittate at

the edge, the part enclosed being dotted. The under surface of the foot is figured in the Voyage of the Astrolabe, pl. 39, f. 17-19.

Inhabits the Paumotu Islands, generally.

Figure 307, the animal, in the posture of motion.

RICINULA CLATHRATA (LAMARCK), Anim. sans Vert., x. 49. REEVE; Conch. Icon., f. 9.

ANIMAL pale beneath, above greenish cinereous, with a marginal dotting of brown. Tentacles annulate with brown at the tips.

Inhabits Raraka, and others of the Paumotu Islands.

Figure 308, the animal, as in crawling.

Several other animals of *Purpura* and *Ricinula* were figured, but it is so difficult to decide upon the shells to which they belong, that it has been thought best to omit them. It is worthy of remark, however, that in the *Ricinuloid* species, the colours green and violet enter largely, while in the typical *Purpuræ*, bright currant-red with pale blue is more characteristic. *Ricinula* seems to be especially a native of the low coral islands.

PLEUROTOMA SEMINIFERA (*Gould*).

Testa subulato-turrita, fuscescens, filis deorsum crescentibus cincta: spira anfractibus ad duodecim, juxta suturam carinatis, deinde excavatis, ad medium nodulis obliquis rubris ornatis: apertura angusta, trientes duos longitudinis testæ adequans; caudâ brevi; sinu æquè latâ ac profundâ; columellâ rectiusculâ; fauce lividâ.

Pleurotoma seminifera, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 140. May 1849. Expedition Shells, 63.

SHELL subulate turreted, of a dusky brownish colour, excepting on the ribs, where it is bright red; surface covered with delicate, re-

volving threads, becoming larger as they approach the base. Whorls twelve, having a delicate raised line bordering the suture, followed by a concavely excavated canal, then a series of oblique, tubercular folds at the middle not reaching the suture below: aperture one-third the length of the shell, narrow: rostrum short, slightly recurved; notch about as deep as broad, opposed to a conspicuous callus on the left lip; pillar nearly straight, pale purplish-brown; interior livid.

Length an inch and three-eighths; breadth three-eighths of an inch.

Habitat unknown; obtained by *Lieut. Walker*.

Closely allied to *P. interrupta*, Lamarck, but differing from the figures in colour, and from the description in having a more decidedly excavated girdle in front of the suture, in the greater obliquity of the folds, and in their not reaching to the suture below.

Figures 312, 312 *a*, two views of the shell.

PLEUROTOMA TIGRINA (LAMARCK), *Anim. sans Vert.*, ix. 352. KIENER; *Iconog.*, pl. 8, f. 1. REEVE; *Conch. Icon.*, f. 3.

Foot oval, the anterior angles dilated; beneath violaceous, mottled with small, deep violet spots; above pale, with scattered lilac and orange mottlings. Operculum not near the tip of the foot. The rostrum is conical and cleft vertically at the end; the tentacles are small, subulate, coming off behind the termination of the snout, and having the eyes at the distal third, without a distinct pedicle. Motions moderate.

Habitat, Upolu, Samoa Islands. *Drayton*.

Quoy gives the animal of *P. Babylonica*, as having the eyes at the outer base of the tentacles, and the rostrum as abrupt and cleft below. The description was probably made out from a contracted specimen.

Figure 311, the animal as in crawling; 311 *a*, the locomotive disk.

MANGELIA CITHARA (Gould).

Testa parva, rhomboideo-fusiformis, cinerea, costis acutis longitudinalibus septem instructa, interstitiis concavis, subtiliter transversim striatis: spira turrita, anfractibus septem benè discretis, ultimo ovato-triangulari trientes duos longitudinis testæ adequante: apertura angusta; labro lato, varicoso, posticè rectangulari vix sinuato; columellâ concinnè rugosâ.

Mangelia cithara, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 140. May 1849. Expedition Shells, 63.

SHELL minute, rhomboid-fusiform, ashy-white, with about seven elevated, acute, longitudinal folds; the intervening spaces concave and minutely striated spirally. Spire turreted, whorls seven, decidedly separated by an impressed suture, apex acute; last whorl two-thirds the length of the shell, somewhat triangular-ovate. Aperture half the length of the shell, very narrow; lip formed by one of the ribs, flat and broad, forming a right angle posteriorly, with scarcely anything like an emargination; pillar finely wrinkled.

Length three-eighths of an inch; breadth three-twentieths.

Inhabits the Feejee Islands.

This shell is much like *M. Hornbeckii*, a West Indian species, but it has a much narrower aperture, fewer ribs, and the last whorl shorter. *M. pessulata* has also many more ribs, and is much less acuminate anteriorly.

Figures 313, 313 *a*, two views of the shell, enlarged; 313 *b*, natural size.

TEREBRA CRENULATA (LIN.), LAMARCK; Anim. sans Vert., x. 239. SOWERBY; Thesaur. Conch., pl. 41, f. 18, 19.

ANIMAL lemon-yellow.

Figure 314, the animal as in motion; 314 *a*, locomotive disk; 314 *b*, front view of the animal.

TEREBRA DIMIDIATA (LIN.), LAMARCK; Anim. sans Vert., x. 240. SOWERBY; Thesaur. Conch., pl. 41, f. 7, 8.

ANIMAL lemon-yellow, scarcely to be distinguished from the preceding. Operculum orange.

TEREBRA BABYLONIA (LAMARCK), Encyc. Meth., pl. 402, f. 5. Anim. sans Vert., x. 243. KIENER; Iconog., pl. 14, f. 39.

ANIMAL orange-coloured.

Figure 315, the animal as in motion.

TEREBRA LEVIGATA (GRAY), SOWERBY; Thesaur. Conch., pl. 44, f. 93.

ANIMAL pale slate-colour, with lemon-coloured reflections.

Figure 316, the animal as in motion.

TEREBRA SUBULATA (LIN.), LAMARCK; Anim. sans Vert., x. 242. SOWERBY; Thesaur. Conch., f. 16, 38, 39.

ANIMAL "transparent creamy white." [J. P. C.]

Figure 317, the animal as in motion.

TEREBRA CÆRULESCENS (LAMARCK), Anim. sans Vert., x. 245. KIENER; Iconog., pl. 67, f. 12.

ANIMAL pearly white or faintly bluish; foot much more expanded than in the other species. Operculum very small, lemon-coloured.

Figure 318, the animal as in motion.

From the above animals, we may very well deduce the characters of the mollusk of this genus.

ANIMAL having an expanded foot, nearly as broad as long, escutcheon-shaped, the anterior angles a little dilated, obtuse posteriorly, the lateral edges delicately undulate. Siphon very long; head very small, with very short tentacles, bearing the eyes at the tip; mouth concealed between the head and foot, which latter advances before the head about as much as it extends behind it, and rises into the shell on quite a stout pedicle.

Colours all pale watery-white, without variegation, or merely tinted orange, bluish, or cream-colour.

BUCCINUM VELATUM (*Gould*).

Testa solida, ovato-lanceolata, levis, polita, livido-violacea, albido-reticulata, versus labrum pallescens, et lineolis rubiginosis cincta: spira acuto-conica, anfractibus septem ad octo convexiusculis, serie suturali gemmularum coronatis, ultimo trientes duos longitudinis testæ adequante et ad basim spiraliter striato: apertura ovalis, posticè canaliculata; labro acuto, extrorsum incrassato, intus decem-sulcato; sinu siphonali obliquo, profundo, castaneo-tincto.

Buccinum (*Bullia*?) *velatum*, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 151. June 1850.

SHELL solid, smooth and polished, oblong-ovate, somewhat pyramidal, with four or five revolving basal striæ, and a sutural delicate circlet of papillæ. Colour a slaty, livid violet, or pale plum-colour, with an underlying network of white points arranged in quincunx, only perceptible on careful observation; the sutural vitta is paler, the indented portions only being dark; the region approaching the lip also grows paler, and is marked by numerous rusty-coloured, revolving lines; this portion is also plaited; spire elongated, whorls seven or eight, very slightly convex, the last one two-thirds the length of the shell, enlarging nearly to the base: aperture less than half the

length of the shell, rounded elliptic, with a well-marked callus and narrow channel posteriorly; outer lip roundly arcuated, within ten-sulcate, columella concavely arched; siphonal constriction not deep, notch oblique, short, edge chestnut; interior bluish-white.

Length one inch; breadth two-fifths of an inch.

Inhabits Mindanao, Philippine Islands.

This may be compared with *Buccinum vittatum*, but is smaller, and proportionally shorter. Its aperture has the posterior callus, and small, closed, siphonal notch of *Nassa*. The sutural vitta is very delicate; and its peculiar coloration, especially its pale lace-like reticulation, is quite distinctive.

Figures 319, 319 *a*, dorsal and ventral views of the shell.

BUCCINUM FUNEREUM (*Gould*).

Testa elongata, ovato-conica, lurido-cinerea, striis tenuibus cincta: spira turrita, anfractibus sex ad septem supernè excavatis, infernè plicis longitudinalibus undatis: apertura angusta, ovalis, dimidiam longitudinis testæ adequans; labro simplici, postice emarginato; columellâ rectiusculâ; fauce hepaticâ.

Buccinum funereum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 152. January 1850. Expedition Shells, 50.

SHELL small, elongate, turreted, ovate-conic, cinereous when dry, smoky-brown when wet, surface with very indistinct revolving lines; each whorl is divided into two portions, an upper third, which is simple and slightly concave, and two lower thirds, occupied by raised, rib-like, longitudinal folds, terminating very abruptly, so as to look like an angle of nodules, when viewed posteriorly; the interspaces about equal to the raised portions. Whorls six or seven, the last one two-thirds the length of the shell; aperture half as long as the shell, narrow oval; lip emarginate, effuse, and incurved posteriorly, sharp and simple; pillar smooth, but little curved; interior liver-brown.

Length one inch; breadth half an inch.

Inhabits New Zealand.

Another of the peculiar group of liver-coloured *Buccina* from Australia, which seem to have a loose, porous, ash-coloured, superficial layer, with a posterior notch to the aperture (*Tritonium?*). It is well marked by the excavated constriction near the suture, and the coronated appearance produced by the termination of the folds at the middle of the whorls.

Figures 320, 320 *a*, two views of the shell.

BUCCINUM FOSSATUM (*Gould*).

Testa tenuis, ovata, ventricosa, rufo-cinerea, annulis et sulcis subequalibus cincta: spira conica, anfractibus septem convexis, supernis clathratis, ultimo ventricoso, posticè declivi et obliquè fluctuato: anticè brevissimè rostrato; rostro canali valdè effosso cincto: apertura lata, ovato-quadrata; labro valdè arcuato; columellâ obliquè lirâtâ et callo tenui indutâ.

Buccinum fossatum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 152. January 1850. Expedition Shells, 67.

SHELL broad-ovate, elongated, thin, livid, ash-coloured, encircled throughout with raised ridges, of a deeper colour, interspaces of about equal width. On the upper whorls these ridges are formed into coarse granules by longitudinal folds about equally distant, but more shallow. On the upper slope of the last whorl, in some specimens, these are increased so as to become conspicuous, very oblique waves or nodules, terminating at the middle of the whorl. Spire of seven convex whorls, the last of which is ventricose, and has the usually constricted, posterior groove encircling the beak, excavated into a broad, remarkably deep canal; suture linear. Aperture broad, quadrate-ovate; lip sharp, simple, oblique posteriorly, parallel to the axis laterally and perpendicular to it at base, thus forming an obtuse angle at the posterior third, and a right angle at its anterior limit, which is a little in advance of the point of the beak; siphonal notch broad, short, scarcely reflexed; pillar covered with a thin layer of enamel, but in general not enough to obliterate the groove and ridges, so that it

appears corrugated throughout. In old specimens, the callus rises into an elevated marginal wall, with oblique folds and a canal at the angle posteriorly; interior of the aperture with sharp, raised revolving lines.

Length an inch and a quarter; breadth four-fifths of an inch.

Obtained at Puget Sound, at the mouth of the Columbia River, and at San Diego, California.

Its thin structure, ventricose form, the very oblique folds on the upper part of the large whorl, and the remarkable channel around the base of the siphonal notch, are its chief characters. It belongs to the same group as *N. trivittata*, Say. On some specimens a fine thread intervenes between the broader rings.

Figures 321, 321 *a*, dorsal and ventral view of the shell.

BUCCINUM FARINOSUM (*Gould*).

Testa parva, solida, rhomboidea, lutescens rufo cincta, spiraliter granulato-filosa, longitudinaliter undato-plicata, plicis ad octo acutis demum numerosis et propè labrum acutum in varicem terminantibus: spira brevis, conica, anfractibus sex convexis, ultimo acuminato, reflexo: apertura angusta, lunata; labro intus sex-plicata; columellâ rugoso-granulosâ, callosâ; fauce albâ.

SHELL small, short, rhomboid-ovate, longitudinally undate-plicate; folds about eight, rather distant and compressed, sharp on the upper whorls, becoming delicate and numerous on the last whorl, where there is a large abrupt varix at some distance from the lip, and gradually sloping towards it. Transversely the shell is surrounded with regularly spaced, elevated threads, about five on the upper whorls, the whole dotted by lines of growth. Colour yellowish, with indistinct, dusky bands, formed by the interspaces of the revolving lines being coloured when they pass the folds, and quite distinct on the varix; spire short-conic. Whorls six, convex, the last one two-thirds the length of the shell, sloping forwards about equally with the spire, and forming a somewhat elongated, flexed beak. Aperture very narrow-

lunate; lip sharp, slightly curved, having six sharp plaits within; pillar granular-rugose, covered with callus; mouth white.

Length five-eighths of an inch; breadth three-tenths of an inch; length of the aperture three-tenths of an inch.

Found at Kauai, Sandwich Islands.

This little muriciform species is quite pretty. It belongs to Mr. Gray's genus *Polia*.

Figures 313, 313 *a*, two views of the shell.

NASSA MUSIVA (*Gould*).

Testa solida, ovato-conica, polita, albido et olivaceo marmorata, coloribus in maculis quadratis tessellatim dispositis: spira conica, anfractibus sex ad septem convexis, benè discretis, ultimo trientes duos longitudinis testæ, propè labrum pallidiori, longitudinaliter plicato et lineolis olivaceis cincto: apertura dimidiam longitudinis testæ, ovalis, posticè canaliculata; columellâ valdè arcuatâ, obliquè sulcatâ; labro intus sulcato, sulcis fuscatis.

Nassa musiva, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 153. January 1850. Expedition Shells, 68.

SHELL ovate, elongated, apex acuminate, solid, highly polished and shining, absolutely destitute of striæ, except two linear, revolving grooves around the siphonal notch, and four or five longitudinal folds just behind the lip; the three apical whorls also are plaited. Colour clouded white and olivaceous, the clouding composed of minute quadrate spots arranged in revolving series, in some parts articulated, the several series distinctly bounded by olivaceous threads, especially towards the aperture, where the general colouring is also paler, and the whole resembling fine mosaic work. Whorls six to seven, rather ventricose, forming a very narrow shoulder at the suture, which is deeply impressed; the last whorl three-fourths the length of the shell. Aperture half the area of the shell, oval, the outer lip somewhat incumbent posteriorly, so as to form a posterior fissure at the angle,

sharp, anteriorly sulcated, the depressed portions dark livid, except near the edge; pillar lip strongly arcuated at its central portion, having a distinct, revolving lamina posteriorly, and elongated granules anteriorly; siphonal notch deep, narrow, oblique; anterior portion of the pillar-lip well covered with appressed, rounded callus.

Length four-fifths of an inch; breadth nine-twentieths of an inch.

Inhabits the Cape de Verd Islands.

This is one of the most beautiful species of the genus, and is well characterized by its polished surface, and its clouding of white and olive, made up of little quadrate spots, arranged in encircling series resembling mosaic. It may be *B. pictum*, Dunker.

Figures 324, 324 a, two views of the shell.

NASSA LURIDA (Gould).

Testa solida, conico-ovata, lævis, livido-cinerea albido-variegata: spira conica, acuta, turrata, anfractibus septem ad octo convexiusculis, supernè tabulatis et ad angulum crenato-nodosis, apicalibus plicatis, ultimo anticè sulcis tribus ad quatuor cincto et ponè labrum plicato; suturâ canaliculatâ: apertura dimidiam longitudinis testæ, ovalis, posticè emarginata; columellâ posticè lamelliferâ, anticè dentiferâ; labro acuto, albo, extus incrassato, intus sulcato; canali siphonali profundo.

Nassa lurida, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 153. January 1850. Expedition Shells, 68.

SHELL solid, ovate-turreted, smooth, and shining, the upper whorls longitudinally plaited and somewhat crenulate at the posterior margins, or rather nodulous on the larger whorls, also with four or five acute folds behind the lip, and about three or four revolving grooves around the siphonal notch. Colour greenish-ash, finely freckled with white, the nodules white and the spaces between them darker, sometimes decidedly blackish; approaching the lip it gradually becomes white, as does also the siphonal region. Whorls seven or eight, distinctly shoul-

dered above, the upper ones nearly plane, the last subglobose two-thirds the length of the shell; suture canaliculate. Aperture half the length of the shell, oval; lip sharp, regularly arched; pillar margin moderately arcuated, with a sharp lamina posteriorly near the angle, and the remainder finely and irregularly folded, terminating at the notch in a thin, sharp, ascending tooth; siphonal notch very deep, oblique, the left margin produced into a thin delicate lamina; interior sulcated, dusky in the channels, except near margin; callus scanty, not appressed.

Length seven-tenths of an inch; breadth three-eighths of an inch.

Inhabits Tutuilla, Samoa Islands.

This species resembles *N. musiva*, in surface and colour, but the spire is longer and more turreted, and there is merely a mottling of colours, without any definite arrangement. The specimens actually obtained by the Expedition are of the size represented with the animal, but they appear to be identical with larger specimens in my own cabinet.

Figure 325, ventral view of the shell; 325 *a*, the animal, with the shell, as in crawling; 325 *b*, the animal, from beneath.

NASSA CURTA (Gould).

T. abbreviata, ovato-conica, lutescens interdum rufo subfasciata, sub-spinosa, longitudinaliter plicata; plicis ad tredecim tenuibus, acutis, liris conspicuis decussatis: spira conica, anfractibus sex convexiusculis; ultimo globoso octantes quinque longitudinis testæ adequante: apertura rotundato-ovalis; labro crenulato, intus sulcato, extrorsum incrassato; columellâ callo copioso granuloso indutâ; sinu siphonali angusto, profundo.

Nassa curta, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 153. January 1850. Expedition Shells, 69.

SHELL small, rather thin, short, ovate-conic, folded throughout with about thirteen sharp, moderately elevated, longitudinal folds, decus-

sated by crowded, elevated threads, not interrupted as they pass the folds, about five on the penultimate whorl; some of these, generally one next the suture, and one about the middle of the last whorl, being larger than the others, are rendered somewhat spinous. Colour ashy-white, the interspaces of the revolving lines rusty-brown, and sometimes banded by an occasional still darker line. Spire short, conic; whorls six, the upper ones nearly flat, the last large, globose, five-eighths the length of the shell. Aperture half the length of the shell, broad-oval, channeled posteriorly; lip thickened, crenulate, sulcate within to the edge; pillar strongly arcuated, with a retral lamina, elsewhere finely granulate, corrugate, extensively but not thickly covered with callus; siphonal constriction very deep, region white, notch very narrow, throat white.

Length nine-twentieths of an inch; breadth eight-twentieths of an inch.

Inhabits the Samoa Islands.

Remarkable for its broad, abbreviated form. In some of its characters it is allied to *N. muricata*, but its surface has much more numerous and more delicate asperities. Some specimens are distorted and still more finely sculptured, losing in a great degree the longitudinal folds. *Bucc. scabrum*, Dunker, must be like it, but is described as larger, more solid, and slender.

Figures 326, 326 *a*, two views of the shell, enlarged; 326 *b*, natural size; 326 *c*, aperture, enlarged.

NASSA CINCTELLA (Gould).

T. solida, ovato-conica, nitida, albida lineâ unicâ rufâ cincta, plicis longitudinalibus acutis ad decem et striis volventibus ad octo decussata: spira conica, anfractibus septem planiusculis angustè tabulatis, ultimo subgloboso trientes duos longitudinis testæ adequante: apertura angusta, ovalis, dimidiam longitudinis testæ haud equans: labro crenulato, extus incrassato, intus septem-sulcato; columellæ callo haud appresso, concinnè rugoso; incisurâ siphonali angustâ, profundâ.

Nassa cinctella, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 154. January 1850. Expedition Shells, 69.

SHELL minute, solid, shining, short ovate-conic, apex entire, yellowish-white, with a single brown thread on the middle of the last whorl, which appears along the suture on the other whorls; lip purplish. Surface with distant, elevated, somewhat compressed longitudinal rib-folds, about ten on the last whorl, reaching to the siphonal constriction, which is well-marked; these are crossed by crowded, impressed lines, about eight on the penultimate whorl, the one around the middle of the last whorl, which is coloured, being a little more prominent than the rest, causing the whorl to be a little angular. Spire conical, whorls about seven, flat, decidedly shouldered above, the last two-thirds the length of the shell, subglobose. Aperture less than one-half the length of the shell, small, oval; outer lip much thickened externally, crenulated by the revolving lines, with seven or eight prominent sulci within; columella with a prominent, posterior lamina, and minute corrugations in front; callus not copious, not appressed; interior white (or perhaps croceous), the dark vitta appearing within.

Length seven-twentieths of an inch; breadth one-fifth of an inch.

From the Pacific Islands.

This very pretty shell is well marked by its short, conical form, its few prominent ribs, shouldered whorls, and thread-like vitta. It accords well with *Bucc. Jonasii*, Dunker, except that one of the principal characters of that shell is to have the interior of the lip smooth.

Figures 327, 327 *a*, two views of the shell, enlarged; 327 *b*, natural size.

NASSA CASTA (*Gould*).

Testa tenuis, lanceolata, vitrea, alba fasciis rubiginosis binis cincta, longitrorsum costato-plicata; plicis ad quatuordecim, striis remotis volventibus decussantibus: spira acuto-conica, anfractibus octo convexiusculis, apicalibus politis, ultimo quadrantes tres longitudinis testæ ferè

adequante: apertura elliptica; labro acuto, intus undecim-striato; columellâ callosâ, concinnè corrugatâ; sinu siphonali amplo.

Nassa casta, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 154. January 1850. Expedition Shells, 69.

SHELL small, thin, vitreous in lustre, ovate-conic, apex acuminate; white, with two rusty bands, one around the middle of the last whorl, and one near the suture, the colour only appearing in the intervals of the ribs. Surface with about fourteen longitudinal, compressed rib-folds, extending to the base, crossed by revolving lines, which are sufficiently apparent about the base and at tip, but are only faintly marked between the folds elsewhere. Whorls eight (the three apical ones smooth and vitreous), slightly convex, the last three-fifths the length of the shell; siphonal constriction scarcely apparent. Aperture half the length of the shell, elliptical; lip regularly arcuated, with eleven sharp striæ within; pillar lip deeply concave, finely corrugated, with a prominent lamina posteriorly; siphonal notch rather large; fauces white.

Length two-fifths of an inch; breadth one-fifth of an inch.

Inhabits the Pacific Islands.

This elongated, glistening shell has no one with which it may be well compared. It is a little like *Bucc. macula*, in size and form, but in other respects it is more like *B. Cuvieri*.

Figures 328, 328 *a*, dorsal and ventral views of the shell, enlarged; 328 *b*, natural size.

NASSA ACINOSA (*Gould*).

T. solida, ventricosa, ovata, lutescens cinereo obscure fasciata, papillis c sulcis volventibus et longitudinalibus æquè remotis ubique obsita, serie suturali majori: spira conica, anfractibus ad octo planis, declivibus, supernè tabulatis, ultimo magno, ventricoso: apertura parva, angusta; labro acuto posticè sinuato, intus quinque ad sex-sulcato; columellâ valdè concavâ, callo tenui indutâ; posticè lamelligerâ, regione siphonali plano, albo, sinu amplo, profundo; fauce fusco-fasciatâ.

Nassa acinosa, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 154. January 1850. Expedition Shells, 69.

SHELL of medium size, rather thin, broad-ovate, apex acute, of an ashy-white, indistinctly banded with slate-colour. Surface decussated with sharp, longitudinal, and revolving ribs, about equally spaced each way, thus forming ranges of acute papillæ of uniform size, except the upper range, which is larger, three on the upper and eight on the lower whorl. Spire short conic, whorls seven or eight, the upper ones not convex, distinctly shouldered, the last one large and ventricose, comprising the greater part of the shell. Aperture one-half the length of the shell, small, narrow; lip thick behind, acute-edged, slightly arcuate, with five or six folds within; pillar strongly arcuate at the middle, with a prominent lamina and distinct canal posteriorly; callus thin, not appressed; the siphonal region is white and without a conspicuous constriction: notch very ample; interior with a central and basal dark band.

Length seven-tenths of an inch; breadth two-fifths of an inch.

Habitat unknown.

Differs from the shell given by Kiener as young *B. marginulatum* by its more ventricose form, much coarser sculpture, less elongated spire, and the presence of the posterior lamina on the pillar. It may be compared with *Bucc. Gruneri*, Dunker.

Figures 329, 329 *a*, two views of the shell, enlarged; 329 *b*, natural size.

NASSA PAUPERA (*Gould*).

T. parva, solida, ovato-lanceolata, albida lineâ rufâ unicâ cincta, longitrorsum octodecim-costulata, et liris continuis cincta: spira acuto-conica, anfractibus sex ad septem ventricosis, ultimo brevi, subgloboso; suturâ profundâ: apertura parva, subcircularis, trientem longitudinis testæ adequans; labro arcuato, intus decem-striato; columellâ anticè productâ, callo granuloso haud appresso parcè indutâ.

Nassa paupera, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 155. January 1850. Expedition Shells, 70.

SHELL minute, thin, elongate, conic-ovate, dingy-white, with a single brown thread on the middle of the last whorl, following the suture on the other whorls: surface with longitudinal rib-undulations, about eighteen on the last whorl, crossed by raised, revolving threads, about five on the upper and ten on the lower whorls, which are less eminent as they cross the ribs. Whorls six or seven, ventricose, the last short, and only about half the length of the shell; siphonal constriction not deeply impressed, suture deep. Aperture proportionally small, about one-third the length of the shell, subcircular; lip regularly arcuate, with nine or ten fine laminæ within; callus on the anterior part of the column, not appressed, minutely granular, prolonged at the siphonal notch.

Length three-eighths of an inch; breadth one-fifth of an inch.

Inhabits the Pacific Islands.

Much resembling *Bucc. coccinella*, but smaller, less ponderous, more slender, the last whorl proportionally larger, the ribs less numerous, but the revolving lines more so.

Figures 330, 330 *a*, two views of the shell, enlarged; 330 *b*, natural size.

NASSA MENDICA (Gould).

Testa parva, rudis, solidula, elongata, rufo-cinerea, longitrorsum undatoplicata, spiraliter crebrè lirata, epidermide tenui lutoso induta: spira elongata, anfractibus sex ad septem ventricosis, ultimo ellipsoideo, dimidiam longitudinis testæ superante: apertura parva, alba, ovata; labro simplici, vix crenulato, intus decem-laminato; columellâ productâ, arcuatâ, vix callosâ; sinu siphonali amplo.

Nassa mendica, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 155. January 1850. Expedition Shells, 70.

SHELL small, rather light, elongated, ovate-turreted, dull brown, becoming ash-coloured when dry, longitudinally undate-plicate, spirally encircled with raised threads, with equal interspaces, about seven on the penultimate whorl, the depressed portions darker than the raised. Spire elongate-conic, this form being continued nearly to the base. Whorls six or seven, convex, the last a little more than half the length of the shell, ellipsoidal; constriction around the siphonal canal well-impressed; this groove broad, short, a little reflexed and somewhat contorted. Aperture small, not more than one-third the length of the shell, rounded-ovate; lip sharp and simple, having a series of about ten laminæ within, not reaching the edge: pillar strongly arched, smooth, slightly invested with an ivory callus, the point projecting as far as the lip does anteriorly; fauces white, the siphonal notch tinted salmon-coloured.

Length four-fifths of an inch; breadth two-fifths of an inch.

Inhabits Nisqually, Port Discovery, &c., Puget Sound. *Pickering*.

A somewhat rude shell, very variable in its surface, being the Pacific analogue of *N. trivittata*, Say. It is more solid, more undulated, less shouldered, its pillar lip more protracted, and its aperture smaller. It is also closely allied to *N. perpinguis*, Hinds, from the California coast, though differing essentially from his description and figure, which represent that shell as much larger, the surface less uneven, and the last whorl very much larger proportionally.

Figures 331, 331 a, two views of the shell, natural size.

NASSA RUBRICATA (*Gould*).

Testa parva, elongata, ovata, granulata, epidermide fulvo lineis interruptis rufis cincto induta, longitrorsum quindecim costato-plicata, plicis ad anfractum ultimum obliquis, versus labrum evanescentibus, et striis impressis decussatis; striâ suturali majori, seriem gemmularum efformante: spira acuto-conica, anfractibus sex convexiusculis: apertura dimidiam longitudinis testæ haud equans, rotundato-ovata, lactea; labro intus crenulato; sinu siphonali mediocri.

Nassa rubricata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 155. January 1850. Expedition Shells, 70.

SHELL small, solid, conic-ovate, with about fifteen to twenty longitudinal rib-like folds, which become oblique on the last whorl, and gradually shorten until they nearly disappear near the aperture; these are decussated by threadlike, impressed striæ, about five on the upper whorls and ten on the last, besides a deep canal around the siphonal region; the upper stria is generally more deep than the others, and produces a sutural range of gemmules. Whorls six, conico-convex, the last two-thirds the length of the shell, and rather ventricose at base; aperture not quite half the length of the shell, rounded-ovate, pure white; outer lip short-arcuate, with very fine internal sulcations; pillar lip rounded and polished, callus not abundant; epidermis fawn-coloured, colour pale-yellowish, with the spaces between the striæ coloured with reddish-brown bands, generally interrupted as they cross the ribs; siphonal canal short and rather shallow.

Length five-eighths of an inch; breadth one-third of an inch.

Its habitat is a little uncertain, but probably is the Pacific coast of America.

I know not any species with which to compare this, except, perhaps, *Bucc. corrugatum*, from which it differs in its aperture. Its elongated form, oblique folds on the outer whorl, and its white aperture, are its most conspicuous points. When deprived of its epidermis, the revolving fawn-coloured lines interrupted by the ribs give quite a distinctive character.

Figures 332, 332 *a*, two views of the shell, natural size.

NASSA LILACINA (*Gould*).

T. parva, ovato-conica, levigata, lilacina: spira acuta, anfractibus septem ad octo convexis, ad suturam crenulatis, supernis plicatis et striis volventibus cinctis; ultimo dimidiam longitudinis testæ adequante, basi spiraliter striato: apertura lunata; labro simplici; sinu siphonali amplo, brevi.

ANIMAL nearly colourless and transparent, tinted rose-colour. Operculum small, vermilion at the centre and orange-coloured at the margin.

SHELL small ovate-conical, polished, of a delicate lilac-colour; spire conical, whorls seven or eight, convex, crenulated at the suture, the upper ones folded, and the folds intersected by revolving lines, so as to render them granular; the last whorl half the length of the shell, with a few distant, shallow striæ surrounding the base; lip simple; columella arcuated, white; siphonal notch sufficiently large, very short.

Length two-fifths of an inch; breadth one-eighth of an inch.

Found on a coral ledge, at Clermont Tonnerre, Paumotu Islands.

Very much like *N. lurida*. The animal is represented as very active, crawling almost as fast as a fly would run.

Figure 336, animal, with the shell, in the act of motion; 336 *a*, under surface of the foot.

NASSA MURICATA (QUOY), Voy. de l'Astrol., 450, pl. 32, f. 32, 33. KIENER; Iconog., f. 110. LAMARCK; Anim. sans Vert., x. 198.

ANIMAL pale cream-coloured, with clusters of indigo-blue dots near the margin; siphon also dotted; beneath pale-bluish, with linear points along the centre, and a few transverse ones near the border.

Figure 333, animal, with the shell, as in motion; 333 *a*, locomotive disk.

NASSA GRANIFERA (KIENER), Iconog., pl. 27, f. 111. LAMARCK; Anim. sans Vert., x. 196.

ANIMAL broad and short, the anterior angles much elongated; siphon short; colour unspotted drab.

Figure 334, the animal, with the shell.

The animal of the genus *NASSA* may be described as follows:

Foot elongated, narrowing somewhat backwards, bifid at the tip, and bearing on each of the points an erect cirrus; anterior angles very much elongated; head small, tentacles long, and very slender beyond the eyes, which are at their lower third; siphon very long. Margin of the operculum serrated.

COLUMBELLA GAUSAPATA (Gould).

T. parva, solidula, elongata, ovato-conica, ad basim spiraliter striata, sub epidermide rudi subrufo concinnè rufo-reticulata vel variemodè maculata aut fasciata: spira conico-turrita, anfractibus sex ad septem convexiusculis, ultimo trientes duos longitudinis testæ, anticè subitò in rostrum brevem angustato; suturâ valdè impressâ: apertura angusta lunata; labro simplici, rufo, intus sparsè denticulato.

Columbella gausapata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 170. January 1850. Expedition Shells, 71.

SHELL small, solid, ovate-turreted, elongated, without striation except a few lines around the beak, smooth, polished, covered with a dense russet-coloured epidermis, having indistinct, paler maculations beneath. Whorls six or seven, nearly flat, the last less than two-thirds the whole length, abruptly sloping to the beak, which is short; suture linear, abrupt, deeply impressed; aperture one-third the length of the shell, narrow-lunate; lip simple, with a few rib teeth within, both margins deep purplish-brown; callus on the pillar not abundant; interior pale-lilac.

Length half an inch; breadth one-fifth of an inch.

Inhabits Puget Sound, Oregon.

This is an inelegant, very simple species, allied to *C. unicolor*, and *C. castanea*. It is more slender and less ventricose than the latter; the aperture is more narrow, less deep brown, rather a yellow; and its burrowing suture, and rough, woolly epidermis, are sufficiently

distinctive. It has much the character and marking of *C. Broderipii*, Reeve, but is nearly twice as large. On removing the epidermis the surface below is polished, finely reticulated with zigzag, fawn-coloured lines, with sometimes one or two zones of purplish, or of ivory-white lunate spots.

Figure 337, ventral view of the shell, enlarged; 337 *a*, dorsal view, with the epidermis removed; 337 *b*, natural size.

COLUMBELLA VALGA (*Gould*).

T. ovato-lanceolata, sub-distorta, fulvo-marmorata et lineolis crebris rufis cincta, ad apicem rosacea: spira acuminata, anfractibus novem ad decem convexiusculis, supernis longitrorsum tenuiter plicatis, ultimo lævi, contracto, cæteris nonconformibus dimidiam longitudinis testæ superante; suturâ profundâ: apertura angusta, lunata; labro arcuato acuto, intus sulcato: columellâ transversim plicatâ, callosâ; sinu siphonali angusto, producto.

Columbella valga, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 169. January 1850. Expedition Shells, 71.

ANIMAL deep ochreous yellow; siphon annulated with ochreous.

SHELL small, solid, ovate-lanceolate, somewhat gibbous, shining, of a pale fawn-colour, girdled by threadlike chestnut bands, of which there are four or five on the upper whorls; these upper whorls have delicate, longitudinal folds, which appear on the lower whorl, but slightly at its upper portion; base of the lower whorl with a few revolving threads. Whorls nine or ten, slightly convex, the penultimate whorl large in proportion to the basal whorl, so as to give the shell a gibbous or distorted form; last whorl three-fifths the whole length of the shell, tapering to the base; rostrum somewhat elongated, recurved; suture linear, deeply impressed. Aperture narrow, two-fifths the length of the shell; outer lip regularly and slightly arcuated with rib-striæ within; pillar margin angular at its upper third, well covered with callus.

Length half an inch; breadth one-fifth of an inch.

There is some little doubt about the habitat of this shell; but it is either Brazil or the Samoa Islands.

Closely allied to *C. avara*, Say, in form, size, and ground colour, but readily distinguished by its distorted form, the encircling chestnut lines, and the want of revolving striæ between the folds.

Figure 338, animal, with the shell, as in motion; 338 *a*, profile view of the shell.

COLUMBELLA CASTANEA (*Gould*).

T. parva, solida, elongata, ovata, lævis, castanea vel fasciâ angustâ albidâ cincta: spira ovato-conica, anfractibus septem convexis, ultimo ovali trientes duos longitudinis testæ superante, ad basim spiraliter striato: apertura ampla, alba; labro recto, posticè emarginato, rufo-tincto, intus sub-plicato; columellâ anticè plicatâ; sinu siphonali amplo.

Columbella castanea, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 170. January 1850. Expedition Shells, 71.

SHELL small, solid, smooth, shining, elongated-ovate, pale chestnut-colour, with sometimes a pale girdle about the middle of the last whorl, a few revolving striæ about the base, and occasionally a few indistinct ridges about the body of the whorl. Whorls seven, regularly convex, the last rather more than two-thirds the length of the shell, tapering to base; upper margin of the whorls terminating abruptly in a delicate shoulder, dropping into a deep canaliculate suture. Aperture narrow-ovate; outer lip somewhat sinuous posteriorly, striated within; columella with a callus rising like a wall; rostrum very short, truncated; peristome of both margins coloured rich brown; interior porcelain-white.

Length half an inch; breadth three-eighths of an inch.

Inhabits Rio Janeiro.

Compared with *C. unicolor* it is smaller, the aperture is less rotund, and it has a pale cincture.

Figures 339, 339 *a*, ventral and dorsal views of the shell, magnified two diameters; 339 *b*, natural size.

COLUMBELLA MENDICARIA (LIN.), LAMARCK; Anim. sans Vert., x. 272. SOWERBY; Genera of Shells, f. 4. KIENER; Iconog., pl. 6, f. 1.

ANIMAL above dark reddish-brown, with a few whitish annulations on the siphon, and a yellow stripe on the mantle corresponding to the yellow band on the shell; plantar surface sulphur yellow, greenish at tip and somewhat dotted transversely at the margin. Operculum chestnut-coloured.

Figure 341, animal as in crawling; 341 *a*, locomotive disk.

COLUMBELLA LIGULA (DUCLOS), Monog., pl. 11, f. 11–16. SOWERBY; Thes. Conch., pl. 38, f. 83–85.

ANIMAL very pale cream-coloured, with very faint, slate-coloured, submarginal dottings.

Figure 342, animal in the posture of motion.

The animal of the genus COLUMBELLA is long and slender, with a long, siphonal tube; foot folding longitudinally, obtusely pointed behind, anteriorly a little dilated, with a transverse marginal fascia; head small, protruding beyond the foot; tentacles short, subulate, the eyes midway, below which is a dilatation. Operculum none.

It is as closely allied to the animal of Mitra as possible, in external form. The foot may be a little more dilated anteriorly, and there is a minute operculum to Mitra, while there is none to Columbella. Conus is equally closely allied.

MITRA VITELLINA (Gould).

T. lanceolata, solida, dilutè aurantia maculis albis fasciata, sulcis linearibus ad quindecim lirata et striis tenuibus crebris cincta; inter-sectionibus punctatis: spira elevata, anfractibus octo ad novem planis,

ultimo octantes quinque longitudinis testæ, cylindræo, anticè angustato: apertura angusta; labro recto, simplici; columellâ quadri-plicatâ, sinu siphonali brevi, vix recurvo.

Mitra vitellina, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 170. January 1850. Expedition Shells, 72.

SHELL slender, fusiform, solid, with fine, longitudinal fissures, pretty regularly disposed, and with hair-like, revolving striæ, much more closely arranged, which, in the fissures, are deeply indented, the posterior one being at a considerable distance from the suture, and those about the base being much more deeply sculptured. Colour pale orange, with an imperfect white vitta adjacent to the posterior revolving striæ, a second at the anterior third of the last whorl, and with the other parts of the shell, slightly mottled with white, except the sutural portion. Whorls eight or nine, conical, abrupt at the suture, the last about five-eighths the length of the shell, the median portion cylindrical, the basal but slightly constricted. Aperture one-third the length of the shell, longitudinally narrow, lip mostly parallel to the axis, siphonal portion slightly recurved, broad; columella parallel to the lip, with four plaits.

Length an inch and three quarters; breadth seven-twentieths of an inch.

Habitat uncertain, probably East Indies.

An elegant species, about the size of *M. subulata*, having the general form and coloration of *M. glabra*, Sw., and is sculptured more like *M. impressa*, Reeve.

Figure 352, dorsal and ventral views of the shell.

MITRA COPHINA (*Gould*).

T. fusiformis, albida, liris volventibus et liris longitudinalibus altioribus ubique reticulata; areolis interceptis profundis: spira turrita, anfractibus novem ad decem planiusculis subtabulatis, ultimo antrorsum in rostrum contortum subitò desinente: apertura angusta, flexuosa, posticè obtusa; columellâ quadri-plicatâ, plicis antrorsum minoribus.

Mitra cophina, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 171. January 1850. Expedition Shells, 72.

SHELL of moderate size, fusiform, slender, dead ashy white, surface longitudinally barred with twenty or more slender, elevated, compressed, regularly spaced ribs; the interspaces are also barred with finer, less elevated, and less distant lines (eight on the penultimate whorl), not crossing the long ridges, leaving deeply-excavated, transversely quadrate impressions in the intervals; spire turreted, of nine or ten conical whorls, the last five-eighths the length of the shell, ventricose at the upper part, but becoming attenuated and forming an elongated, contorted beak, with an oblique, elevated varix near its point. Aperture not half the length of the shell, narrow, a little oblique, posterior termination broad and transverse; columella with four folds, the two anterior very small, its wall being an erect lamina to the canal.

Length four-fifths of an inch; breadth three-tenths of an inch.

Inhabits Singapore. *Pickering*.

The form, size, and colour is like *M. suturata*, Reeve, but the sculpture is quite different, that species having no longitudinal ridges, and the transverse grooves are described as deep and punctured, and the intermediate ridges slightly granose.

Figures 355, 355 a, two views of the shell.

MITRA RORATA (*Gould*).

T. modica, solida, lanceolata, cinerea rubiginoso-marmorata, clathris longitudinalibus quadratis ad triginti et striis tenuibus volventibus decussata: spira elevata, anfractibus novem ad decem planis posticè angulatis; ultimo cylindraceo anticè sensim attenuato, dimidiam longitudinis testæ superante: apertura angusta, labro acuto, roseo, tredecim sulcolato; columellâ quadri-plicata; rostro lato obliquè reflexiusculo: fauce incarnatâ.

Mitra rorata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 171. January 1850. Expedition Shells, 72.

SHELL of moderate size, lanceolate-fusiform, slender, solid, shining, dull-white, marbled with ferruginous and fawn-coloured blotches, arranged somewhat longitudinally; surface finely decussated with delicate, well-relieved longitudinal ribs, the presenting edges flat, about thirty on each whorl, and with impressed, revolving lines (about eight on penultimate whorl), which only appear in the interstices of the ribs, until from the middle of the last whorl they begin to enlarge, and finally become predominant about the base. Whorls nine or ten, flat, angular at the upper fourth, and shelving to the suture, this portion destitute of striæ; last whorl more than one-half the length of the shell, cylindrical at the middle, and tapering gently to the base. Aperture narrow, lips nearly parallel, more than one-half the length of the shell; lip slightly arched, sharp, faintly roseate; interior flesh-coloured, and with about thirteen delicate, elongated, raised threads; pillar a little arched posteriorly; four-plaited; siphonal notch a little reflexed obliquely.

Length four-fifths of an inch; breadth three-tenths of an inch.

Habitat unknown. Obtained by *Mr. Walker*.

The form and sculpture are much like that of *M. hebes*, Reeve, but the colouring is more like *M. crenifera*. It is more cylindrical, and the bars are less prominent than *M. cophina*, besides being different in coloration.

Figures 354, 354 *a*, dorsal and ventral views of the shell.

MITRA CAPILLATA (*Gould*).

T. parvula, elongata, ovato-fusiformis, polita, rufo-castanea lineolis longitudinalibus flexuosis croceis ornata: spira acuto-conica, anfractibus septem convexiusculis, ultimo bifariam attenuato, anticè striis prominulis cincto; suturâ impressâ: apertura dimidiam longitudinis testæ, angusta, elliptica; columellâ tri-plicatâ, posticè callosâ; fauce luridâ.

Mitra capillata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 171. January 1850. Expedition Shells, 73.

SHELL quite small, polished, shining, elongated, ovate-fusiform, very deep mahogany-brown colour, beautifully variegated with numerous, delicate, obliquely flexuous, yellowish, longitudinal stripes, destitute of sculpture except three or four raised threads about the beak; whorls seven, slightly convex, the last nearly three-fourths the length of the shell, tapering downwards about equally with the spire; suture linear, impressed. Aperture half the length of the shell, quite narrow elliptical; lip simple; columella with three folds, the upper of which is largest, and with a deposit of callus at the posterior angle; colour of the interior lurid.

Length nine-twentieths of an inch; breadth one-fifth of an inch.

Inhabits the Madeira Islands. *Couthouy*.

This beautiful little shell is easily identified by its dark mahogany colour, and its delicate yellow lineations, like those on some species of *Neritina*. *M. semen*, Reeve, which is not so slender, and has fewer and broader lines, is the only species approaching it.

MITRA ENCAUSTA (*Gould*).

T. parvula, solida, curta, ovato-rhomboidea, cinerea, longitrorsum octo ad novem-plicata et sulcis fusciscentibus cincta: spira conica, anfractibus octo ventricosis, supernis granulosis, ultimo trientes duos longitudinis testæ adequante; suturâ canaliculatâ: apertura parva, linearis; labro acuto, vix sulcato; columellâ plicatâ, posticè callo copioso indutâ.

Mitra encausta, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 172. January 1850. Expedition Shells, 73.

SHELL quite small and solid, short, rhomboid-ovate, about equally acuminate each way, ash-coloured, with eight or nine coarse longitudinal folds, and with deeply incised, regularly spaced, revolving striae of a dusky colour, about four on the whorls of the spire, rendering the upper ones granular, more distant and coarser at base, where the raised portions are granular. Whorls eight, ventricose, with a somewhat channeled suture; the last whorl two-thirds the length of the

shell; tip black; aperture very small and narrow, one-half the length of the shell; lip thin, sharp, a little plicate; columella four-plicate, with a copious posterior callus.

Length seven-twentieths of an inch; breadth one-fifth of an inch.

Inhabits the Feejee Islands.

A small, very decidedly marked species, most remarkable for the deeply incised, somewhat punctate, dark, revolving lines, on an ash-coloured ground, its wave-like folds, and its short rhomboidal form.

Figures 356, 356 *a*, two views of the shell, enlarged; 356 *b*, natural size.

MITRA FIDICULA (*Gould*).

T. lanceolato-fusiformis, livido-crocea fasciâ albidâ unicâ cincta, plicis acutis albidis ad duodecim lirata; spira anfractibus novem planulatis posticè tabulatis, apicalibus (ultimo quoque ad basim) spiraliter striatis: apertura angusta, intus tenui-striata; columellâ quadri-plicata; fauce rufâ; canali siphonali curto, ferè recto.

Mitra fidicula, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 170. January 1850. Expedition Shells, 72.

SHELL small, fusiform, elongated, turreted; whorls nine, angular above, ornamented with numerous sharp, regular, whitish ribs or folds, which are sometimes a little nodular at the angle of the whorl, and with a belt of whitish; the upper whorls and the large whorl at its base are spirally striated; the spaces between the ribs are smoothly fluted, displaying delicate incremental lines; colour deep saffron, sometimes a little livid, disposed in darker and lighter zones. Aperture narrow, less than half the length of the shell; throat brownish within, and delicately striated, the striæ not attaining the edge of the lip. Columella four-plaited; siphonal notch broad, canal short and straight.

Length three-fourths of an inch; breadth three-tenths of an inch.

Habitat uncertain.

There is no species corresponding very nearly to this. Perhaps *M. cinerea*, Reeve, resembles it as much as any one.

Figures 353, 353 *a*, two views of the shell; 353 *b*, dorsal view of a variety.

MITRA AMBIGUA (SWAINSON), Zool. Illust., Second Series, pl. 30, f. 2. REEVE; Conch. Icon., f. 8. KIENER; Iconog., f. 16. LAMARCK; Anim. sans Vert., x. 346.

ANIMAL smoky brown, longitudinally dotted, with a pale margin; proboscis very long, having a sub-globular dilatation at its posterior fourth; the extremity is also dilated, and from it issues a filiform, forked tongue.

Figure 344, the animal, with the shell.

MITRA ADUSTA (LAMARCK), Anim. sans Vert., x. 306. Voy. de l'Astrol., pl. 55, f. 8, 9. REEVE; Conch. Icon., pl. 4, f. 25. KIENER; Iconog., f. 15.

ANIMAL short, indigo-blue, dotted with white above; sole of the foot pale sky-blue, dotted with indigo-blue; anterior angles not dilated.

Found at Vincennes Island, Paumotu Group. *Couthouy*.

Figure 344, the shell, with the animal extended; 344 *a*, locomotive disk.

MITRA ACUMINATA (SWAINSON), Zool. Illust., Second Series, pl. 138, f. 3. REEVE; Conch. Icon., f. 158. *Mitra lutea*, QUOY; Astrol., pl. 45 bis, f. 7-9.

ANIMAL pale cream-colour.

Figure 345, shell, with the animal extended.

Found at Raraka, Paumotu Islands. *Couthouy*.

MITRA VIRGATA (REEVE), Proceed. Zool. Soc., 1844. Conch. Icon., fig. 197. *M. retusa*, var. Gray.

ANIMAL much like that of *M. retusa*; foot narrow, elongated, with a distinct, transverse, marginal fissure; above ferruginous, white at margin; base of siphon and tentacles colourless, the former tipped with rufous; foot beneath pale blue.

Found at Clermont Tonnerre, Paumotu Islands.

Figure 346, shell, with the animal, as when in motion; 346 *a*, locomotive disk.

MITRA MACULOSA (REEVE), Conch. Icon., figs. 175, 194. MARTINI, Conch. Cab., pl. 150, f. 1400.

ANIMAL milk-white beneath; tentacles cream-coloured.

Figure 347, animal, with the shell, seen from beneath.

MITRA NODOSA (SWAINSON), Philos. Mag. REEVE; Conch. Icon., f. 196. *M. fraga*, QUOY and GAIM.; Astrol., pl. 45, f. 28, 29. LAMARCK: Anim. sans Vert., x. 349. *M. tuberculata*, KIENER; Iconog., fig. 87.

ANIMAL opaque-white, except on the siphon, where it is yellowish; head small, tentacles of moderate length, eyes conspicuous, on a lateral enlargement at their lower third; siphon rather large, and constantly moving as in *NASSA*, to which this genus is closely allied. Motions quite active. No operculum detected.

Common on coral ledges, Clermont Tonnerre. [J. P. C.]

Figure 348, animal, with the shell, seen from beneath.

MITRA ELEGANS (REEVE), Proc. Zool. Soc., 1845. Conch. Icon., f. 233.

ANIMAL milk-white above, freckled along the margin with dusky, and also along the siphon.

Inhabits the Feejee Islands.

Figure 349, animal, with the shell, in the posture of motion.

MITRA EXASPERATA (CHEMNITZ), Conch. Cab., pl. 151, f. 1440-41. REEVE; Conch. Icon., f. 162. LAMARCK; Anim. sans Vert., iii. 344. *M. torulosa*, LAMARCK; ibid., 333.

ANIMAL lemon-coloured above, margin white, pointed with black; tentacles and siphon watery-white.

Found at the Feejee Islands. *Drayton*.

Figure 350, the animal, with the shell, as in motion.

MITRA FILOSA (BORN), Mus., pl. 9, f. 9, 10. LAMARCK; Anim. sans Vert., x. 321. REEVE; Conch. Icon., f. 81. KIENER; Iconog., f. 12.

ANIMAL cream-coloured; body elongated; tentacles very small; siphon long and slender.

Inhabits the Feejee Islands.

Figure 342, the animal, with the shell, as in motion.

VOLUTA MAGELLANICA (GMELIN), in KIENER; Iconog., pl. 51. SOWERBY; Thes. Conch., 99. *V. ancilla*, LAMARCK; Anim. sans Vert., x. 397. Encycl. Meth., pl. 385, f. 3.

ANIMAL with a very large, muscular, oblong-oval foot, broad and nearly right-angled in front, narrowing behind, the surface divided into oblong protuberances by radiating and concentric furrows. Colour above brownish-purple, thickly dotted with small chocolate-coloured spots; beneath yellowish-brown. Head long, compressed, having on each side a projecting lobe narrowing towards the neck. Near the upper margin of these lobes are the eyes, like two obscure, dull-black points. Just inside of the eyes originate the tentacles, which are short, acutely conical; a fissure extends from their base to the margin of the cervical mass, separating the lateral and inferior lobes from the frontal one; the whole of this part is lighter-coloured than the foot. Siphon nearly two inches long, cylindrical, very thick and muscular, with short triangular processes at the base on each side, spreading out upon the head when the animal is extended.

Only a single specimen was found, at Burnt Island, in Orange Harbour, on sandy bottom. It was very sluggish, and during the three weeks that it was kept alive, it extended itself but once. It secreted abundance of clear, glairy fluid, like white of eggs. [J. P. C.]

Figure 357, dorsal view of the animal and shell.

VOLUTA ANCILLA (SOLANDER), in SOWERBY's Thes. Conch., f. 101. KIENER; Iconog., pl. 52. *V. Magellanica*, LAMARCK; Anim. sans Vert., x. 398. Encycl. Meth., pl. 385, f. 1, a, b. *V. gracilis*, Wood's Suppl.

ANIMAL deep orange near the margin, soon blending into a broad zone of rich crimson, which again passes into deep orange; over the whole surface are dispersed numerous small tubercles of bright yellow, larger and more apparent on the crimson zone than elsewhere; under side of foot pale orange. Foot nearly smooth, broad-oval, and when fully expanded, extending far beyond the shell in all directions, except posteriorly, where it does not quite reach the apex of the shell. Head broader than long, much compressed, forming three sub-equal lobes, of which the central one is emarginate. Tentacles short, conical, obtuse, arising a short distance from the margin at the anterior third of the cervical mass; at a short distance behind, and near the margin are the eyes, which are small, black, and seated in a circular depres-

sion, margined white. Siphon short, very thick, with a short, flattened, conical process on each side of the base. Head and siphon coloured like the foot in similar zones, but the tubercles are nearly white instead of yellow, and much smaller than on the foot. [J. P. C.]

Inhabits the region of Cape Horn.

Much confusion seems to have arisen between this and the preceding species, on account of their general form being similar, their colouring still more so, and from their inhabiting the same localities. Were the shells alone compared, they might be regarded as varieties of the same species; but that they are distinct species, I think Mr. Couthouy has satisfactorily shown, by the essential differences in the form and colouring of the animals. The mark by which Lamarck distinguishes *V. Magellanica* from *V. ancilla*, viz., the number of folds on the columella, is of no validity, since this number varies in both species. Relying rather upon the form, which is abbreviated and somewhat coronated in the first, slender and with simple convex whorls in the latter, I should be inclined to coincide in the synonymy as given by Kiener and Sowerby, rather than in that of Deshayes.

Figure 358, dorsal view of the shell, and the animal expanded.

MELO BRODERIPPI (GRAY), Griffith's Cuvier, pl. 26. KIENER; Iconog., pl. 6. *Melo regius*, BRODERIP. SOWERBY; Thes. Conch., pl. 83, f. 26, 27.

ANIMAL very large, oblong, twice the length and breadth of the shell. Colour purplish, verging to orange at the edge, and veined with fawn-colour, beneath ochre-yellow. Foot advancing before the head, bilobate in front, projecting behind the shell, obtuse at the point. Head trilobate in front; tentacles short, subulate, whitish at tip; eyes black and large, at the outer base of the tentacle. Siphon long and tapering, with a process from each margin, where it issues from the shell, resembling a pair of cow's horns; pale at the edges, and bluish within. Mantle simple, lemon-coloured at the edge, with a transverse banding of purplish-brown.

Obtained at the Straits of Balaback, China Sea.

Figure 359, the animal and shell.

OLIVA CARNEOLA (GMELIN), LAMARCK; Anim. sans Vert., x. 621. WOOD; Index Testac., pl. 19, f. 43. KUSTER; Conch. Cab., pl. 6, f. 10, 11.

ANIMAL pale yellow, a few fine dots anteriorly on the mantle, the anterior angles long lanceolate, dotted also; siphon pale; papillæ of the mantle somewhat dusky, obtuse; tentacles dotted; a long, pale proboscis, as long as the siphon, becoming orange at tip, is protruded; foot lobes moderately developed posteriorly.

Found at the Feejee Islands.

Figure 380, lateral view of the animal and shell.

CYPRÆA TESTUDINARIA (LIN.), LAMARCK; Anim. sans Vert., x. 491, for synonymy. REEVE; Conch. Icon., f. 9. KIENER; Iconog., pl. 15 and 16, f. 1.

ANIMAL dark fawn-colour; margin of the foot coarsely reticulate; mantle longitudinally lineate, beset with scattered, elongated, two or three-pointed papillæ, the tips of which are white; end of the siphon violaceous.

Obtained at Upolu, Samoa Islands, and Feejee Islands.

Figure 370, lateral view of the animal and shell.

CYPRÆA TIGRIS (LINNÆUS), for synonymy see LAMARCK; Anim. sans Vert., x. 502. REEVE; Conch. Icon., f. 12. SOWERBY; Conch. Ill., f. 90.

ANIMAL ochreous, the mantle longitudinally lineated with olive, and having dusky blotches corresponding to the spots on the shell; foot with fine diverging lineations, finely blotched with chlorine-coloured spots at the margin, and more so near the shell; tip of head violaceous; siphon salmon-coloured.

In several respects it will be seen that the colours differ from those given in the *Astrolabe*; the papillæ of the mantle are more numerous and less frequently forked.

Obtained at the Straits of Balaback, Feejee, Tonga, Molucca, and Society Islands.

CYPRÆA RETICULATA (MARTYN), Univ. Conch., pl. 15. REDFIELD; Ann. Lyc. Nat. Hist. N. York, iv. 482, pl. 16, f. 1, where, also, see synonymy. REEVE; Conch. Icon., f. 3. CYPRÆA MACULATA (BARNES), Ann. N. York Lyceum, i. pl. 9, f. 1. *C. histrio*, KIENER; Iconog. pl. 18, f. 1.

ANIMAL with the mantle coloured burnt-sienna, with undulating veins of very deep brown, and very thickly ornamented with short, slender, and taper papillæ; towards the aperture it is lighter coloured than elsewhere. Head and siphon dark umber, the latter fringed at the extremity with papillæ similar to those on the mantle. Tentacles lighter coloured than the head, moderately long, largest near the eyes, which are about midway, and surrounded by a small circle of white. Sides of the foot coloured like the under side of the shell, irregularly veined darker. Underneath it is cream-coloured.

The coloration and papillæ of the animal fully justify the separation of this shell from *C. histrio*, as a distinct species. It was found at Disappointment Island (Atooa) one of the Paumotu Group.

Figure 371, lateral view of the animal and shell; 371 *a*, under side of the foot.

CYPRÆA FIMBRIATA (GMEL.), SOWERBY; Conch. Ill., f. 138, 140. REEVE; Conch. Icon., f. 92.

ANIMAL uniform blood-red, with minute white tentacular papillæ; siphon long.

Inhabits the Paumotu Islands.

Figure 372, side view of the animal and shell; 372 *a*, under surface of the foot.

CYPRÆA ASELLUS (LINNÆUS), for synonymy see LAMARCK; Anim. sans Vert., x. 529. SOWERBY; Conch. Ill., f. 93. KIENER; Iconog., pl. 31, f. 3. REEVE; Conch. Icon., f. 98.

ANIMAL having the mantle dark slate-colour, with simple aculeate, white papillæ; foot dusky, with three transverse black bands; head, tentacles, and sole of the foot, ferruginous.

Inhabits Tutuilla, Samoa Islands.

Figure 374, lateral view of the animal and shell; 374 *a*, under side of the foot.

CYPRÆA CAURICA (LINNÆUS), LAMARCK; Anim. sans Vert., x. 516, with synonymy. SOWERBY; Conch. Ill., f. 158–60. REEVE; Conch. Icon., f. 46. KIENER; Iconog., pl. 10, f. 2, 3.

ANIMAL having the mantle emerald-green, everywhere dotted above with white; principal pallear fringes intricately fimbriated at their tips, and encircled with three series of white, gem-like papillæ, intermingled with short, simple aculei; base of the true tentacles pearly; head and tips of tentacles orange; foot white beneath; siphon covered with branching papillæ.

Obtained at Tutuilla, Samoa Islands.

Figure 373, side view of the animal and shell; 373 *a*, an isolated papilla, enlarged.

CYPRÆA FELINA (GMEL.), LAMARCK; Anim. sans Vert., x. 560. SOWERBY; Conch. Ill., f. 135–37. REEVE; Conch. Icon., f. 105.

ANIMAL rose-red, with very delicate, small, beard-like papillæ on the mantle.

Inhabits Tutuilla, Samoa Islands.

CYPRÆA ERRONES (LINNÆUS), SOWERBY; Conch. Ill., f. 128-29. KIENER; Iconog., pl. 29, f. 4. REEVE; Conch. Icon., f. 56. *C. olivacea*, LAMARCK; Anim. sans Vert. x. 520, with synonymy.

ANIMAL with the foot and mantle pale, veined with dusky, the mantle edged with black mottlings; papillæ minute, subulate, cream-coloured; head and tentacles scarlet.

Obtained at Lebuka, Feejee Islands.

CYPRÆA HUMPHREYSH (GRAY), SOWERBY; Conch. Ill., f. 55. REEVE; Conch. Icon., f. 110 c. KIENER; Iconog., pl. 14, f. 4. *C. lutea*, DESHAYES, in LAM.; Anim. sans Vert., x. 562.

ANIMAL crimson; mantle with very minute, simple, pointed papillæ; tentacles slate-coloured.

Inhabits Sandalwood Bay, Feejee Islands.

Figure 376, lateral view of the animal and shell.

CYPRÆA PORARIA (LINNÆUS), LAMARCK; Anim. sans Vert., x. 527. SOWERBY; Conch. Ill., f. 68. REEVE; Conch. Ill., f. 99.

ANIMAL rosaceous; mantle with a crowd of numerously branched, pale roseate papillæ; siphon pale yellowish; foot merely tinted reddish; mouth deep rose-red.

Obtained at Benga Island, Feejees.

Figure 375, side view of the animal; 375 a, under side of the foot.

CYPRÆA CARNEOLA (LINNÆUS), LAMARCK; Anim. sans Vert., x. 505, with synonymy. REEVE; Conch. Icon., f. 19. KIENER; Iconog., pl. 37, f. 3.

ANIMAL fuliginous; foot purplish-black; mouth orange; tentacles pale greenish-yellow; papillæ white, rather large, simply subulate.

* Obtained at Lebuka, Feejee Islands.

CYPRÆA LYNX (LINNÆUS) LAMARCK; Anim. sans Vert., x. 513, with synonymy. REEVE; Conch. Icon., f. 33. KIENER; Iconog., pl. 38, f. 2. SOWERBY; Conch. Ill., f. 107, 118.

ANIMAL dingy-purplish, edge of the foot above with clusters of black points; mantle with violaceous tints; tubercles large, short, multifid palmate.

Inhabits the Feejee Islands.

Figure 369, lateral view of the animal.

CYPRÆA EBURNA (BARNES), Annals Lyceum Nat. Hist. N. York, i. 133, pl. 9, f. 2. REEVE; Conch. Icon., f. 35.

ANIMAL olivaceous, very finely reticulated; head and tentacles purplish-violet; mantle and siphon yellowish, clouded with purplish; papillæ long and slender, deeply three and four cleft, tips yellow; foot short, anterior angles largely dilated.

Obtained at the Tonga and Feejee Islands.

Figure 378, lateral view of the animal and shell.

CYPRÆA ARENOSA (GRAY), Zoolog. Journal, i. 147, pl. 8 and 12, f. 6. LAMARCK; Anim. sans Vert., x. 549. REEVE; Conch. Icon., f. 27. KIENER; Iconog., pl. 2, f. 4.

ANIMAL cream-coloured, with decussating wrinkles causing the margin to appear darker; head and tentacles, above the eyes, dark purple-brown; mantle cream-coloured, with two or three deep purple blotches on the sides; papillæ delicate, white, bifid.

Inhabits Tahiti.

Figure 377, animal, with the shell.

CYPRÆA OBVELATA (LAMARCK), Anim. sans Vert., x. 538. SOWERBY; Conch. Ill., f. 13. KIENER; Iconog., pl. 34, f. 4. *C. obvallata*, REEVE; Conch. Icon., f. 69.

ANIMAL with the mantle wax-yellow, studded with pale stars, with fine, undulating, transverse, brown lineations, well garnished with delicate, bifid papillæ, one of the points being longer than the other; foot pale, with radiating pencillings of bluish.

Inhabits Tutuilla, Samoa Islands.

Figure 379, lateral view of the animal and shell.

CONUS DILECTUS (*Gould*).

T. parva, gracilis, conica, albida, ferrugineo concinnè reticulata et seriebus binis macularum candidarum et rufarum alternantium cincta: spira elevata, concavo-conica; anfractibus octo ad novem, angulatis, coronatis, posticè striatis, ultimo inermi, anticè sex ad octo sulcato: apertura linearis; columellâ rectâ; fauce incarnatâ.

Conus dilectus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 172. January 1850. Expedition Shells, 73.

ANIMAL delicate carnation-coloured, with a dark submarginal line; front vermilion; siphon vermilion at tip, and banded at the middle with deep indigo-blue.

SHELL small, acutely and accurately conical; spire elevated, its profile a little concave; whorls eight or nine, with a very finely nodulous, acute-angled carina, below the middle, the space above the angle with about four revolving striæ; the angle on the outer whorl is not nodular; just in front of the suture are very fine, longitudinal wrinkles. Colour dingy-white, everywhere covered with minute reti-

culations of pale, rusty lines, with a series behind the middle and another at the anterior third of the last whorl, of several large, lunate or triangular, white spots, alternating with dark ferruginous spots; and there is the same alternation on the shoulder of the last whorl; around its anterior portion are six or eight grooves. Aperture narrow and straight; pillar straight; interior flesh-coloured.

Length half an inch; breadth one-fourth of an inch.

Inhabits the Feejee Islands.

This is a beautiful little species, somewhat like *C. corallinus*, Kiener, and painted somewhat like *C. ammiralis*.

Figure 367, shell, with the animal; 367 *a*, ventral view of the shell.

CONUS VEXILLUM (MARTINI), Conch. Cab., tab. 57, f. 269. LAMARCK; Anim. sans Vert., xi. 51. KIENER; Iconog., pl. 34, f. 1. REEVE; Conch. Icon., f. 3.

ANIMAL dusky above, with splendid indigo-blue reflections about the head, siphon and anterior part of foot, becoming greenish towards the posterior point; beneath, deep emerald green; tentacles stout; eyes about midway. Operculum obliquely fan-shaped.

Obtained at Tutuilla, Samoa Islands.

Figure 361, the animal and shell.

CONUS MILES (LIN.), MARTINI, Conch., tab. 59, f. 663-4. LAMARCK; Anim. sans Vert., xi. 52. QUOY and GAIM.; Astrol., pl. 52, f. 11. SOWERBY; Conch. Ill., f. 100. REEVE; Conch. Icon., f. 9. KIENER; Iconog., pl. 38, f. 2.

ANIMAL black predominating on a gray ground above, somewhat mottled; foot paler beneath, dotted black; siphon long, finely mottled with black, and black at tip; margin of the mantle black. Foot thick, fleshy, as long as the aperture, with a transverse fold in front, and the

anterior angles a little dilated. Operculum long and slender, attached by a muscular pedicle, which is white, dotted black.

The specimens here referred to were obtained at Honden Island, and are of a small and very solid variety, and very much eroded. The animal was very sluggish. [J. P. C.]

Figure 364, lateral view of the animal; 364 *a*, the disk of the foot.

CONUS HEBRÆUS (LINNÆUS), LAMARCK; *Anim. sans Vert.*, xi. 20, for synonymy. REEVE; *Conch. Icon.*, f. 104. KIENER; *Iconog.*, pl. 4, f. 2.

ANIMAL clouded dark bistre on an ochreous ground over the body; head and siphon the same, their extremities dull red; under side of foot dark smoky-brown, except down the middle, where it is dull ochreous, and the portion above the transverse fissure in front, which is dark red; the tentacles are opaque-white, with the eyes near their tips. Foot broad and fleshy, the anterior angles a little prolonged laterally. Siphon large at base; motions quite rapid, the animal gliding along nearly as fast as *Littorina*. Operculum small, unguiculate, clear brown, about one-tenth of an inch from the tip, projecting a little obliquely towards the spire somewhat beyond the foot.

The animal of this variety, which was found on a coral ledge at the Island of Clermont Tonnerre, differs somewhat from the figure given of it in the *Voyage of the Astrolabe*, pl. 52, f. 5. [J. P. C.]

CONUS NANUS (BRODERIP), *Proc. Zool. Soc., Lond.* 1833. REEVE; *Conch. Icon.*, f. 150.

ANIMAL pale; front and tip of foot, tentacles and tip of siphon, deep carnation.

Found at Tutuilla, Samoa Islands.

Figure 365, lateral view of the animal and shell.

CONUS SPONSALIS (BRUGUIERE), LAMARCK; Anim. sans Vert., xi. 34, for synonymy. REEVE; Conch. Icon., f. 109.

ANIMAL with the head, tip of the siphon, and anterior margin of the foot, bright vermilion, and a spot of the same on the posterior portion of the foot; remainder of the foot rose-coloured; mantle and siphon the same colour, with fine, undulating, white lines. Head projecting in a conical form; tentacles slender, with the eyes near their tips, the portion beyond them alone being retractile, as if the tips were the true tentacles, and the basal portion a firm pedestal. Foot much elongated and posteriorly attenuated; anterior margin with a profound fissure, and the part in front of the fissure is capable of being expanded to a considerable extent. Movements very quick and abrupt, the foot being occasionally stretched to twice the length of the shell; and being advanced far beyond the head, the shell is suddenly brought up with a jerk.

Common in crevices of rock at the water's edge.

Clermont Tonnerre. [J. P. C.]

Figure 363, under side of the foot; 363 *a*, outline of the head, enlarged.

CONUS MILIARIS (BRUGUIERE), Encycl. Meth., pl. 319, f. 6. LAMARCK; Anim. sans Vert., xi. 29. SOWERBY; Conch. Ill., pl. 11, f. 81. REEVE; Conch. Icon., f. 198.

ANIMAL very similar to the preceding, with the head and siphon salmon-coloured, tip of siphon darker than the rest; tentacles paler, colourless at the tips; eyes near the tips. Foot pale yellowish, with a rosy tint at the edges, a little longer than the shell, somewhat narrowed backwards; portion in front of the anterior marginal fissure capable of considerable expansion; mantle clear orange-colour; motions vivacious. Operculum long and narrow, flexuous.

Found in crevices of coral ledges in shallow water, Clermont Tonnerre. [J. P. C.]

Figure 362, animal, from beneath; 362 *a*, enlarged outline of the head.

CONUS MINIMUS (LINNÆUS), LAMARCK; Anim. sans Vert., xi. 19, for synonymy. REEVE; Conch. Icon., f. 143.

ANIMAL above deep violaceous purple, mottled; foot ochreous, mottled with violaceous; tip of foot, and interior of siphon and tentacles rose-red.

Distributed over most of the Pacific Islands.

Figure 366, side view of the animal and shell.

PERONIA INDOLENS, (*Couthouy MS.*)

Corpus oblongo-ovale, antrorsum angustatum, lateribus compressis tuberculato-dentatis: tentacula nigrae, subulatae: caput cordatum; pes dimidiam latitudinis corporis adequans, straminea; color ex fusco-viridi flavescens, subtus ochracea.

Body elongated-oval, somewhat narrowed anteriorly, convex along the middle of the back, and flattened at the edges, which are furnished with coarse tubercles projecting over the margin in twenty-four conical processes, with occasional smaller ones intervening. Tentacles black, subulate, projecting considerably beyond the mantle when the animal is in motion. Head somewhat cordate in front; lips broad and fleshy; mouth destitute of horny appendages, as far as could be ascertained. Foot half the width of the body, tongue-shaped; colour dark bronze-green on the back, inclining to yellow at the margins; under side of the mantle ochreous yellow, foot somewhat paler, with a bluish tinge along the middle.

Length a little more than an inch; breadth one-third of an inch; height one-third of an inch.

Found on rocks at low water on the little Ilha do Pai, outside harbour of Rio Janeiro. [J. P. C.]

PERONIA IRRORATA (Gould).

Corpus elongato-ovale, convexum, flavo et olivaceo nubeculatum, granulis confertis instructum, marginibus dilatatis, plicis radiantibus ad decem quasi denticulatis: caput protractum, lateraliter dilatatum, cæruleum; tentaculis curtis, gracilibus, capitatis, cæruleis: solea trientem latitudinis corporis adequans.

Elongated oval, back arched, margins expanded, mottled olive and yellow, finely covered with minute, subequal granulations, with eight or ten elevated, radiating folds or ridges at the margin on each side, which extend a little beyond the margin, and give it a dentate appearance; head scarcely protruding beyond the body, dilated at the exterior angles; tentacles short, slender, blue, knobbed, and with an eye-spot at the tip; head above pale sky-blue, and also the mantle surrounding the foot; margin beneath ochreous, foot a little more than one-third the width of the body.

Length one inch; breadth half an inch; height one-fourth of an inch.

Found in tide-pools at low water, Bay of Islands, New Zealand. Drayton.

This species may be compared with *P. patelloidea*, which is also from New Zealand; but if the figure is to be relied on, it is certainly different, the colour, form, number of marginal projections, &c., being all different.

Figures 383, 383 *a*, dorsal and ventral views of the animal; 383 *b*, frontal view.

PERONIA ACINOSA (Gould).

Corpus elongatum, sub-cylindraceum, posticè angustatum, ad extremitates rotundatum, papillis beryllinis ornatum; solea dimidiam latitudinis corporis adequans, fusco-violacea; tentaculæ cyaneæ.

ANIMAL elongated, everywhere closely covered with large rounded papillæ of a deep beryl-green colour, shaded in the interstices with amethystine: the same colouring is found below, except the foot, which is a slaty violet, half the width of body. Body attenuated, apparently somewhat cylindrical, equally and acutely rounded at both ends. Tentacles dark blue.

Length nearly an inch and a half; breadth three-fifths of an inch.

Inhabits the Feejee Islands.

A fine species, having a mulberry-like surface, and also remarkable for its unusually dark colours, the general colour being of an amethystine blue, somewhat darker than the rounded papillæ.

Figures 384, 384 *a*, dorsal and ventral view of the animal.

PERONIA MARGINATA, (*Couthouy MS.*)

Corpus elongato-ovatum, convexum, nigro-virescens, papillis minutis numerosis ornatum, ad marginem nigro-fasciatum; caput latum, bilobatum, protensum, flavescens; tentaculis nigricantibus clavatis; pagina inferior flava.

Elongated ovate, narrowed anteriorly; back very convex, deep greenish-black, very thickly covered with minute tubercles; margin ornamented with alternate bars of black and white; head broad, bilobed in front, and projecting considerably beyond the mantle when the animal is in motion, of a pale yellow colour, tinted bluish about the mouth; tentacles rather long, and bulbous at the extremity, pale slate-colour, except at the tips, which are black; under side of the mantle pale yellowish near the foot, becoming greenish at the margin, where it shows alternate bands of green and pale yellow. Foot pale ochreous, to which a bluish tinge is imparted by the viscera.

Length three-fifths of an inch.

This little species was very common under stones at low water, near the mouth of Orange Harbour, usually in groups of perhaps

fifty. When disturbed, it rolls itself up into a rounded mass. In form it is like *Onchidium nigricans*, as given by Quoy and Gaimard, but it is very much larger and differs in many particulars. [J. P. C.]

Figures 386, 386 *a*, 386 *b*, lateral, dorsal, and ventral views of the animal, enlarged; 386 *c*, the animal contracted; 386 *d*, cowl and tentacles, in outline; 386 *e*, natural size.

PERONIA CORPULENTA (*Gould*).

Corpus linguiforme, convexum, suprà cyaneum, infrà olivaceum, tuberculis magnis elevatis rotundatis, minoribus circumjacentibus, instructum; veli marginibus undulatis; cucullo cordato; tentaculis elongatis, linearibus, viridibus: solea pallida trientes duos latitudinis corporis adequans.

ANIMAL elongated oval, truncated in front, deep sea-green above, olivaceous beneath; foot pale; back arched, bearing numerous large, elevated, rounded tubercles, with numerous smaller intervening ones; margins undulated; hood projecting beyond the body, broad as the body, heart-lobed; lobes circular; simple and deep green above, somewhat violaceous beneath; mouth quite small, orange; tentacles linear, rather stout and long, green: foot two-thirds the length of the body.

Length two and a half inches; breadth one inch; height half an inch.

Found at Direction Island, one of the Feejees.

A large species, somewhat irregular in its outline.

Figures 385, 385 *a*, dorsal and ventral view of the animal.

DORIS VERMICELLI (*Gould*).

D. oblongo-ovalis, tumida, verrucosa, ochracea maculis ferrugineis variegata, infra incolorata: caput parvum; tentaculis labialibus tenuibus elongatis: tentaculæ cervicales brevi, compressæ omnino laminatæ:

stella branchialis plumulis numerosis gracilibus crenulatis tri-serialibus; pes latitudinem corporis sub-equans.

Body elongated oval, coriaceous, covered with large verrucosities having numerous smaller ones irregularly disposed around them. Colour pale ochreous, clouded on the back with three or four irregular dark ferruginous blotches, and with two of the same on the sides; beneath colourless. Head small; labial tentacles long and slender, vertically compressed somewhat; cervical tentacles short, ovoid, inserted into a short, tubular, truncated sheath, compressed and exhibiting nine or ten concentric laminæ. Branchiæ composed of innumerable slender, pectinate plumules disposed around the anus in three series, the outer circle extending the width of the body, the plumules of the inner circle about half as long as those of the outer circle, and alternating with them. [J. P. C.]

Length two and a half inches.

Found among rocks exposed to the surf, at Villamar, near Valparaiso.

The very remarkable circles of branchial organs are sufficiently characteristic of this species.

Figure 387, lateral view of the animal; 387 *a*, 387 *b*, lateral and front views of a tentacle in detail; 387 *c*, plumules in detail.

DORIS PLUMULATA, (*Couthouy MS.*)

D. latè ovalis, straminea, minutissimè granulata, D. luteolæ plerumque simillima: tentaculæ cervicales lanceolatae, compressæ: stella branchialis plumulis octo bipinnatis, pinnis nonis, pinnulis exilibus, ciliaribus.

ANIMAL subcylindrical, elongated, in most respects similar to *D. luteola*, but it is proportionally broader, the surface is more finely granulated, the head more elongated, the peduncle of the cervical tentacles is longer, and the club more pyramidal, the lamellæ more numerous and less obliquely disposed, and the sheath ciliate, at its edge. The branchial star is formed of eight plumules, having the inferior fourth of their peduncles united by a membrane; each plumule is a

long, delicate, bipinnate frond; the pinnæ are four opposite and one terminal, each of which shoots out opposing filaments, finely fringed on each side.

Length two inches; breadth an inch and a quarter.

Found on rocks at the water's edge, near the observing station, Orange Harbour.

This species might at first be confounded with the preceding, as its colour and general appearance are the same; but its finely-granulated surface and the structure of the plumules show it to be different.

Figures 388, 388 *a*, lateral and ventral views of the animal; 388 *b*, tentacle, enlarged; 388 *c*, plumule, enlarged.

DORIS LUTEOLA, (*Couthouy MS.*)

D. oblongo-elliptica, convexa, conspicuè granulata, straminea; caput parvum, elongatum; tentaculis labialibus curtis, subulatis; tentaculis cervicalibus, lanceolatis, compressis, laminis perobliquis: stella branchialis plumulis geminatis novem pinnatis, basi connexis: pes angustus.

ANIMAL oblong-elliptical, the sides nearly parallel, moderately convex, coriaceous and covered with very distinct granulations, cream-coloured, with the foot, tentacles, and branchiæ somewhat darkest. Head narrow posteriorly; labial tentacles short, subulate; cervical tentacles ovate-lanceolate, compressed, issuing from a simple tube scoloped at its edge with a series of obliquely ascending laminæ. Branchial star composed of nine pairs of lanceolate, simply pinnate plumules, united at their bases by a membrane; anal duct slender and prominent. Foot much narrower than the body or mantle, which is usually turned up at the sides when the animal is in motion. [J. P. C.]

Length two and a half inches; breadth one inch.

Found on kelp, off Burnt Island, Orange Harbour.

Figures 389, 389 *a*, 389 *b*, lateral, dorsal, and ventral views of the animal; 389 *c*, a tentacle, in detail; 389 *d*, branchial star.

DORIS SMARAGDINA (*Gould*).

D. parva, elongato-ovalis, antrorsum angustata, smaragdina, indico marginata et punctis ocellatis numerosis cæruleis picta; tentaculis et branchiis flavidis: tentaculæ labiales curtæ; tentaculæ cervicales elongatæ, lamellis profundis: stella branchialis magna; plumulis duodecim lanceolatis pinnatis, pinnis quindecim.

Small, elongated-oval, somewhat widest behind. Colour a deep emerald-green, with a margin and numerous rounded eye-spots, about one-twentieth of an inch in diameter, deep indigo-blue. Mantle, tentacles, and branchiæ gamboge-yellow. Labial tentacles short; cervical tentacles elongated, lamellæ coarse and deep. Branchial star large, three-fourths the diameter of body; plumules twelve, pinnate, simple; leaflets seven on each side, and a terminal one, rather long. Anal tube delicate and elongated.

Length an inch and a half; breadth half an inch.

Obtained at Vincennes Island, Paumotu Group. *Couthouy*.

Figures 390, 390 *a*, lateral and dorsal views of the animal; 390 *b*, the tentacles; 390 *c*, branchial plumules, enlarged.

DORIS PETECHIALIS (*Gould*).

D. rotundato-ovalis, depressa, argillacea aurantiaco marginata et petechiis rosaceis ornata, subtus incolorata, aurantiaco limbata; tentacula cervicales chermesinæ, acuminatæ; stella branchialis plumulis rosaceis angustis lanceolatis pinnatis sex: pes angustus corpore brevior: caput minimum; tentaculis labialibus curtis, conicis.

ANIMAL rounded-oval, depressed, pale, a little slate-coloured each side, and with a marginal orange-coloured line, and a submarginal lemon-coloured shading; over the whole surface are small, regularly

disposed, rose-red blotches, like petechiæ. Cervical tentacles tapering, vermilion-coloured, with only a minute portion laminated. Branchial star of six narrow, tapering, pinnate plumules. Head very small; labial tentacles short, conical; foot narrow, shorter than the body; beneath colourless, the mantle and foot bordered with pale orange.

Length two and a half inches; breadth an inch and a quarter.

Obtained at Honolulu, Oahu, Sandwich Islands.

The drawing of this species is somewhat imperfect; yet its characters are sufficiently obvious for its identification.

Figures 391, 391 *a*, dorsal and ventral views of the animal.

DORIS LILACINA (*Gould*).

D. magna, elongata, lateribus anticè dilatatis retrorsum angustata, lilacina maculis saturatioribus notata, granulata: caput parvum: tentaculæ cervicales clavatæ, reflexæ: stella branchialis magna; plumulis sex trifoliatis, foliolis profundè sinuatis.

ANIMAL rather large, somewhat prismatic, much elongated, obtuse in front, rather tapering behind. Colour lilac, tinted roseate along the middle, and mottled with rather large darker spots; there is an angular dilatation at the sides opposite the tentacles; behind these a broad, ruffled, and ochreous margin; cervical tentacles small, ochreous, club-shaped, reflexed, lamellar. Branchial star seated very far back, very large, wider than the body, composed of six large, trifoliate plumules, each of the folioles deeply and perhaps doubly sinuate; margin yellow. Beneath yellowish, shaded and finely spotted with lilac; foot as long as the body and two-thirds as wide, rounded at tip, anterior angles not dilated; head small, rounded, placed deep beneath the hood.

Length three and one-third inches; breadth an inch and a quarter.

Obtained at Honolulu, Oahu, Sandwich Islands.

Remarkable for the angular dilatations at the neck, like a trilobite; and

for the ruffled margin posterior to them, and especially for the peculiar form of the plumules, like the leaves of *Acanthus*.

Figures 392, 392 *a*, dorsal and ventral views of the animal; 392 *b*, lateral view in outline.

DORIS CEREBRALIS (*Gould*).

D. grandis, elongata, ovoidea, retrorsum angustata, dorsuosa, ex olivaceo flavescens: tentaculæ cervicales recurvæ, capite laminato, conico; labiales subulatæ, citrinæ: stella branchialis magna, plumulis sex foliatis, bipinnatifidis, acanthiformis: tubus analis curtus, pinnis coronatus: pes angustus, brevis: pallium flavo-marginatum, rufo-purpureo nubeculatum.

ANIMAL large, elongated ovoid, widest anteriorly, tough and rigid, and raised into ridges somewhat like the convolutions of the brain; there is a longitudinal range of these ridges on each side of the median line from the tentacles to the branchiæ, with lateral branches like stomachs of the leech, and they also form ranges of concentric undulations near the margin. Colour olivaceous with yellowish shadings, darker in the depressions; beneath, the edge of the mantle is bright yellow, then purple-brown. Cervical tentacles recurved, horn-shaped, the laminated portion obliquely conical, yellowish-brown; labial tentacles lemon-coloured, subulate. Branchial star large, nearly as wide as the body; plumules six, brownish, broadly expanded, doubly pinnate, the primary clefts, three on each side, not extending to the rachis, the folioles crenate. Anal tube short, the summit crowned as with battlements; foot narrow, not reaching to either extremity of the body, cream-coloured along the centre. Head small, concealed under the mantle.

Length five inches; breadth two and three-fourths inches; width of the foot an inch and a quarter.

Taken from a reef in Sandalwood Bay, Feejee Islands.

The motions of this animal are noted as being "very slow." The

branchial plumes are gashed very much, like the leaves of the *Acanthus*, or of parsley.

Figures 393, 393 *a*, lateral and dorsal views of the animal; 393 *b*, branchial plume, enlarged; 393 *c*, anal tube, enlarged.

DORIS AURITA (*Gould*).

D. elongata, depressa, anticè truncata, sanguinea, pustulis raris instructa; tentaculis et branchiis sulphureis: tentacula cervicales brevi, recurvæ, ad apicem obliquè laminatæ; stella branchialis magna, foliis octo involutis, plumosis, albidis; tubus analis simplex, curtus; regio anterior fimbriis lateralibus auribus simulantibus, et areâ inferiori (an ore?) sulphureo marginatis insignis: pes angustus, lateritius; margine flavo.

Body elongated, rather depressed, somewhat truncate anteriorly. Colour bright crimson, with small scattered tubercles, resembling full pustules, which with the tentacles, branchiæ, and margin of the body, are sulphur-yellow; cervical tentacles short, stout, recurved, obliquely lamellate at tip. Branchial star large, nearly as wide as the body, with eight large incurved plumes, like ostrich plumes, becoming white towards their tips; anal tube very short, simple. Near each anterior angle there is a curious lateral, earlike appendage, or crypt, tipped yellow, and a similar transverse area beneath, perhaps the mouth. Foot pale brick-red, margin yellow.

Length three and a half inches; breadth an inch and one-fifth.

Obtained from a reef, Sandalwood Bay, Feejee Islands.

This animal bears a general resemblance to *D. aurea*, Quoy, which has but five branchial plumes, with lines of small dots along the body. The figure seems to have been taken when the animal was in a contracted state, and the parts about the head are not well made out. It is quite probable that appendages are protruded from within the earlike fringes answering to the labial tentacles.

Figure 394, lateral view of the animal; 394 *a*, under side of the anterior portion.

DORIS SPIRACULATA (*Gould*).

D. oblonga, antrorsum angustata, fulva, punctis aurantiacis et purpureis, maculis albidis dorsalibus duabus, et maculis purpureis elongatis lateralibus utrinque quatuor ornata: tentaculæ cervicales conicæ, recurvæ rufæ: stella branchialis remota, basi cupuliformi, plumulis septem-lobatis (lobis plumosis ad duodecim) ad labium sitis. Infra straminea, maculis rufis longitrorsum picta; caput transversum.

ANIMAL large, oblong, wider behind, extremities rounded, moderately elevated. Colour pale brownish wood-colour, thickly spotted with orange, the series near the margin being purple; on the median line are two large, oval, dirty-white spots; on the submargin (each side) are four elongated, purple spots like spiracles, the one anterior to the cervical tentacles smaller, like an eye; these tentacles are horn-shaped, recurved; tip not dilated, foliated, bright red-brown, tip light. Branchial star far behind, large, consisting of a six-lobed, membranous cup, on the edges of which are seated little fringed, seven-lobed plumes; lobes also plumose; twelve or fourteen leaflets on each lobe, like cactus leaves. Foot not half the width of the body, nor extending to the ends, pale, mottled purplish, with a series of brown blotches along the median line; similar Spanish-brown dots in about four series surround the under side of the mantle near the foot; edge and general surface cream-coloured. Head short and broad, cream-coloured; labial tentacles short, conical; the foot has a distinct, transverse furrow anteriorly.

Length three and a half inches; breadth an inch and a half; height three-fourths of an inch.

Obtained at Direction Island, one of the Feejees.

In many respects it resembles *D. cruenta*, Quoy, but the spots are in general much smaller and more numerous, and the cup-like base from which the branchial plumes arise is very peculiar.

Figures 395, 395 *a*, lateral and ventral views of the animal; 395 *b*, *a* plumule, enlarged.

DORIS SUPERBA (Gould).

D. magna, rotundato-ovalis, fimbriâ latissimâ nisi ad frontem cincta, intensè sanguinea, iridescens, punctis flavis ocellatis hic illic glomeratis irrorata: caput parvum, rotundum; tentaculis labialibus ovalibus palmatis, septem-lobatis; tentaculis cervicalibus curtis, recurvis, acutis; stella branchialis magna, plumulis lilacinis duodecim (paribus sex) racemiferis, racemis quinque-foliatis foliolis quinque-lobatis.

ANIMAL large, rounded oval, with a very broad, ruffled margin, two-thirds as wide as the body, emarginate in front; colour intense blood-red, with a play of purple, everywhere bedewed with minute, ocellate yellow dots, sometimes clustered, as about the tentacles; cervical tentacles short, with a reflexed, conical, lamellar club. Branchial star as wide as the true body, composed of six pairs (twelve grouped by twos) of short, crowded, botryoidal plumes, each cluster composed of five pedicellated, smaller clusters, and each member of these latter being a five-lobed leaflet; pedicle about the length of the cluster; colour pale lilac, tinted red. Anal tube short, simple, exposed.

Beneath, the colour is somewhat paler and dotted in the same manner, shading off and becoming yellow near the margin of the ruffle. Head small, circular, with a seven-lobed expansion on either side, extending to the width of the foot and sweeping backwards; mouth large, longitudinal; lips lemon-coloured.

Length five and a half inches; breadth four inches.

Obtained at Fangasai Bay, Tutuilla, Samoa Islands.

Of the size and colour of *D. Sandwichensis*, Souleyet (Voy. de la Bonite, tab. 25, f. 1-4), but that is less intensely red, the ruffle is not deficient in front, the oral tentacles are less lobed; ruffle pale beneath; back pale and mottled, not dotted; branchial plumes eight, plumose. In almost every point it agrees with *D. flammulata*, Quoy, except in the labial tentacles and plumes.

Figures 396, 396 *a*, dorsal and ventral views of the animal; 396 *b*, cervical tentacle in outline; 396 *c*, plumule and leaflet, enlarged.

DORIS CARDINALIS (Gould).

D. grandis, rotundato-ovalis, sub-lobata, fimbriâ latâ cerasinâ anticè angustatâ cincta, sanguineo et flavido maculata, et lituris purpureis notata; tentaculæ cervicales rubræ recurvæ, clavo conico coronatæ; stella branchialis magna, complexa, plumulis sex dendriticis, tri-ramosis; ramusculis numerosis rosaceis: pes elongatus, papaveraceus: caput parvum, rotundum, rosaceum; tentaculis labialibus explanatis latis, cordatis.

ANIMAL large, broad oval, surrounded by a broad ruffle, somewhat narrowed across the front; body proper somewhat lobulated by three transverse constrictions. Colour mottled yellowish and sanguineous, somewhat violaceous in the transverse depressions, and with four or five purple blotches on the back; ruffle deep cherry-red. Tentacles with a stout red pedicle, the club short, pointed, dark red; branchial star large, complicated, composed of six dendritic plumes, having three principal subdivisions and numerous branchlets, rose-red.

Foot pale poppy-red, larger than the body; ruffle roseate beneath, the intervening space mottled as above with straw-colour and sanguineous, more minutely than above, as are also the head lobes of the ruffle. Head small, circular, rose-red, as are also the cervical expansions, which are obversely heart-shaped or two-lobed, the anterior one smallest.

Length six inches; breadth four and a half inches.

Obtained at Honolulu, Sandwich Islands.

Above, this is much like *D. Sandwichensis*, but the branchiæ are different, the cervical lobes are many-lobed, and it is not mottled beneath. It is intermediate between *D. sumptuosa*, and *D. superba*.

Figures 397, 397 *a*, dorsal and ventral views of the animal; 397 *b*, branchial plumule, in detail.

DORIS SUMPTUOSA (Gould).

D. prægrandis, rotundato-ovata, transversim tri-constricta, ex cerasino purpurascens flavo-punctata, fimbriâ latâ violacescente flavo marginatâ et cerasino submarginatâ cincta: caput parvum rotundum: tentaculæ labiales explanatæ, laciniatæ; laciniis ad duodecim, crenulatis: tentaculæ cervicales clavatæ, reflexæ, rosaceæ: stella branchialis magna, plumulis numerosis trifoliatis biseriatis, foliis serratis, pedunculatis: pes angustus, dilutè rosaceus.

ANIMAL gigantic, broad-oval, surrounded by a broad ruffle, the body proper being divided above into four lobes by transverse constrictions. Colour bright cherry-red with purple reflections, minutely dotted along the back with yellow, and with a patch variegated with yellow blotches at each constriction; the ruffle is mostly violaceous, with red reflections, pale yellow at the edge, and with a submarginal border of bright cherry-red. Head very small, circular, with ovate, roseate, lateral expansions larger than the head, sweeping forwards, with ten or twelve delicate crenulate lobes; mouth large; lips circular; cervical tentacles reflexed, roseate, conically clubbed at the end. Branchial star large, with a double series of foliate plumules, twelve (?) in each series, and each plumule composed of three broad, deeply serrated leaves, seated on a stout, short pedicle. Foot narrow, pale roseate, darker cherry-red, blotched with yellowish on each side; ruffle beneath with a yellow border and bluish-red submargin.

Length ten and a half inches; width eight and a half inches.

Obtained at the Tonga Islands.

This is much the largest species yet made known, and well distinguished from all similar species by its labial appendages or tentacles, its violaceous ruffle, and its profusion of expanded plumules. In size, general form, and colour, it is very much like *D. marginata*, Quoy, (Voy. de l'Astrol., ii. 254, pl. 17, f. 1-5.)

Figures 398, 398 a, dorsal and ventral views of the animal.

DORIS ASPERSA (*Gould*).

D. parva, elongato-ovata, retrorsum angustata, depressa, margaritacea ad limbum flavescens, confertim puniceo-punctata: tentaculæ labiales subulatæ: tentaculæ cervicales lanceolatæ: stella branchialis parva; plumulis octo lanceolatis, pinnatis, rubiginosis; pinnis ad tredecim ciliatis.

ANIMAL small, depressed, elongate-oval, a little the widest in front, pearl-coloured, becoming pale yellow towards the edge, and margined with pale orange. Labial tentacles subulate; cervical tentacles broad lanceolate, with numerous lamellæ standing on a slender pedicle. Branchial star small, about one-third the width of the back; plumules eight, lanceolate, simply pinnate; pinnæ about twelve on each side, with a terminal one finely fringed. Tentacles and branchiæ rusty-yellow; foot somewhat longer than the body.

Length an inch and a half; breadth half an inch.

Obtained at Vincennes Island, Paumotu Group.

Figure 399, 399 *a*, lateral and dorsal view of the animal; 399 *b*, the tentacles; 399 *c*, branchial star.

DORIS DORSALIS (*Gould*).

D. parva, gracilis, elliptica, retrorsum angustata, dilutè lilacina lineâ marginali et submarginali saturatiori, et lineis dorsalibus duabus parallelis sanguineis ornata: tentaculæ labiales parvæ; cervicales clavatae, cinereæ aurantio et indico cinctæ: stella branchialis parva, plumulis sex attenuatis ad septemdecim foliatis, foliorum paribus tribus superioribus colore indico tinctis, cæteris flavidis.

ANIMAL small, depressed, slender, oblong, broadest anteriorly, rounded at the extremities; colour pale lilac, the central region cream-coloured, with two parallel lines along the back, from the branchiæ to the tentacles lake-red, also a marginal and submarginal

darker line, cream-coloured between. Cervical tentacles clavate, pale cinereous at base, annulate with orange at the middle, then with indigo-blue, then with cinereous, and tipped lilac; lamellæ about fifteen; labial tentacles minute; branchial star not as wide as the body, having six tapering plumules, with eight or nine leaflets on each side, and a terminal one, the three upper pairs indigo-blue, the others cream-coloured. Beneath pale; margin of the foot pale lilac, margin of the mantle yellowish. Foot narrow, transverse in front, tapering to a delicate point, which extends somewhat beyond the body.

Length three-fourths of an inch; breadth an eighth of an inch; height one-twelfth of an in c

"Found on shells of *Perna*, in the harbour of Talao, Eimeo."

Couthouy.

By two bright-red lines along the back, and the indigo-barred tentacles and plumes, this species is easily identified. It is allied to "*D. rayée*," Souleyet (Voy. de la Bonite, pl. 25, f. 5-9), which has orange tentacles and branchiæ, and several lines along the back. It is still more like *D. lemniscata*, Quoy, a much larger species, with only slight differences in coloration.

Figures 400, 400 *a*, 400 *b*, lateral, dorsal, and ventral views of the animal; 400 *c*, tentacles enlarged, front and side views; 400 *d*, branchial star, enlarged; 400 *e*, plumule, still more enlarged.

EOLIS ATTENUATUS, (*Couthouy MS.*)

Corpus valdè attenuatum, incoloratum: caput rotundatum; tentaculis labialibus subulatis: tentaculis cervicalibus compressis, ciliatis: pes antice rotundatus: papillæ branchiales numerosæ, flavicantes, utrinque longitudinaliter dispositæ.

Body limaciform, much attenuated posteriorly, colourless except on the back, where there is a faint ruddy tinge; branchial papillæ short, obtuse, very numerous, disposed in a continuous range along each side, from the neck about two-thirds the length of the animal, yellowish, filled in the interior with a brownish substance; head rounded;

labial tentacles subulate, smooth; cervical tentacles compressed and ciliated at their margins. Mouth vertical, with prominent lips, furnished with a pair of corneous plates whose contiguous edges are finely serrate. Foot rounded, and destitute of lateral prolongations in front, tapering to a long, slender point behind. Motions very quick, and the animal much annoyed by exposure to a strong light. [J. P. C.]

Full length two and a half inches; breadth of foot one-fourth of an inch.

Found by Mr. North on a fragment of *Megacystus*, off the coast of Chili, lat. $36^{\circ} 5'$; long. 74° W.

Figures 401, 401 *a*, lateral and ventral views of the animal; 401 *b*, the mouth; 401 *c*, branchial papilla; 401 *d*, jaws.

EOLIS CYANELLA, (*Couthouy MS.*)

E. elongata, straminea; *papillæ branchiales elongatæ, cyaneæ, apicibus purpureo tinctis, in fasciculos utrinque decem glomeratæ: caput orbiculare; tentaculæ labiales graciles; tentaculæ cervicales compressæ, ciliatæ: pes latus, angulis anterioribus valde eductis.*

Body limaciform, moderately convex, straw-coloured; branchial papillæ in ten distinct clusters on each side of the back, from three to six in each cluster, of clear blue colour, tipped with purple. Head orbicular; labial tentacles long and slender; cervical tentacles compressed, ciliated at the edges; foot rather broad, with long lateral projections at its anterior angles like an additional pair of tentacles.

[J. P. C.]

Length two-fifths of an inch.

A beautiful little species found with the preceding.

Figures 402, 402 *a*, lateral and ventral views of the animal; 402 *b*, the mouth; 402 *c*, branchial papillæ, all enlarged; 402 *d*, natural size.

PLACOBANCHUS IANTHOBAPTUS (*Gould*).

Corpus oblongum, triquetrum, posticè abruptum, ex flavido olivaceum, ocellis majoribus cæruleis albo-pupillatis et ocellis minoribus albis aurantiaco-pupillatis ornatum, caudâ et labiis ianthino tinctis: caput latum; tentaculis ochraceis violaceo annulatis: pes pallio haud disjunctus, smaragdinus, ocellatus; plicis branchialibus smaragdinis.

Body elongated, in the form of a three-sided prism, terminating abruptly, as if torn off behind. Head broad, heart-shaped in front, lip edged with violet; tentacles involute, as if formed by an extension of the angles of the hood, ochreous tipped with white, annulate with violet near the lip, retractile at tip. Colour of the back yellowish, shaded with olive, ornamented with two sets of ocelli, the larger in two series of eight on each side, with a blue pupil and white iris, and numerous smaller ones with orange pupil and white iris; foot not distinct from the body except in colour, emerald green, with the blue and orange ocelli smaller, and more nearly equal in size than those of the back. Margins of the body dilated and folded upon the back; branchial folds grass-green, radiating from the cardiac swelling behind the head.

Length two and a half inches; breadth five-eighths of an inch.

Found upon a coral reef at Honolulu, Sandwich Islands.

Though having a general similarity to *P. ocellatus*, its divergence is so great that it cannot be considered as a variety of that species. Its bright colours indicate its exposure to light, but it is perfectly helpless when taken out of the water.

Figures 407, 407 *a*, lateral and ventral views of the animal; 407 *b*, the mantle thrown open, showing the branchial folds; 407 *c*, the side, in outline.

DIPHYLLIDIA RUBIDA (*Gould*).

Corpus lanceolatum, posticè acuminatum, erubescens, dorso concinnè plicato; pallium angustè reflexum; caput cucullatum.

Foot lake-red; back paler, with numerous fine, linear, longitudinal folds running the whole length. Head obtuse, with the hood forming a sort of mask before the tentacles, being detached above and on each side, where it is a little prolonged; eyes at the outer base of the tentacles. Middle of the back gibbous; posterior extremity tapering to a fine point; the expanded mantle turns up on each side, but not sufficiently to completely cover the back. Motions extremely sluggish.

Length an inch and a quarter.

Obtained from a coral reef, Honolulu, Sandwich Islands. *Pickering*.

Figures 406, 406 *a*, lateral and dorsal views.

ELYSIA LOBATA (*Gould*).

Corpus limaciforme, gracile, dilatatum, trilobatum, virescens nigro-punctatum; pallium utrinque flavo-marginatum; tentaculæ elongatæ.

ANIMAL slug-like, greenish, dotted with black and bordered with yellow; edge of the mantle expanded into a three-lobed lateral wing. Head small, with very large and long tentacles, tipped with sky-blue; eyes situated laterally, a little behind the tentacles. In creeping it flaps downwards, at pretty regular intervals, its long, ear-like tentacles. There are no apparent branchial organs, not even the plaits along the back, as in *Placobranchus*, to which it is otherwise evidently allied; the parts about the mouth seem to have been imperfectly figured.

Length one inch.

Found creeping on coral stems, like a small *Doris*, at Honolulu. *Dr. Pickering*.

Figures 405, 405 *a*, lateral and dorsal views of the animal.

TRITONIA CUCULLATA, (*Couthouy MS.*)

T. oblonga, subquadrata, sub-alata, olivacea supernè rufo et albo nebulosa; arbusculis branchialibus curtis utrinque decem; tentaculæ tubu-

losæ, curtæ, clavatæ, retractiles: cucullus cordiformis, amplius, arbusculis ad decem utrinque fimbriatus: pes corpore latior, posticè crenulatus.

Body elongate, laterally compressed, moderately convex on the back, along the sides of which is a narrow, membranous expansion, just inside of which are disposed ten pairs of short, arborescent branchial tufts. The tentacles are short, stout, clavate, tubular, with an irregular fissure at tip, retractile into a sheath. Head prolonged into a frontal hood or veil projecting over the mouth, and having the centre emarginate; each side of this hood is furnished with nine or ten arborescent processes or laciniations. The mouth is large, a transverse duplication of the hood forming a lip full of wrinkles and short papillæ, capable of being drawn over the mouth; foot somewhat wider than the body, tapering posteriorly, and trifid at its extremity, with the middle lobe longest, margins sinuous. Anal orifice on a whitish tubercle just under the third branchial tuft. Genital orifice small, tubular, between the fourth and fifth branchial tufts. Colour above olive-green, mottled with dark reddish-brown and white; sides olive-green, with white specks; foot uniform olive, margined with yellowish. [J. P. C.]

Length two and a half inches; breadth half an inch.

Found among Penei, in the market, Rio Janeiro.

Figures 403, 403 *a*, lateral and ventral views of the animal; 403 *b*, mouth and hood, enlarged; 403 *c*, the tentacle, enlarged; 403 *d*, open extremity of the tentacle; 403 *e*, the penis, enlarged; 403 *f*, transverse section of the body.

GENUS CHIORÆRA—(GOULD).

Corpus limaciformis, caput enorme, pedunculatum, semiglobosum; paginâ ventrali discoideâ; ore longitudinali, seriebus binis cirrhorum cincto: tentaculæ cephalicæ foliatæ, retractiles: lobi branchiales flabel-

liformi, serie unicâ utrinque ordinati: foramen generativum ab anali remotum, fere dorsali.

This curious and hideous animal seems to belong to the family Tritoniadæ, with which it agrees in all respects except its curious oral apparatus. The mouth is inferior, surrounded by a double series of long cirrhi, each of which has an independent motion. Two auriform appendages, on the back of the head, differing in no respect from the branchial expansions except in being destitute of reticulations, seem to be the true tentacles, and are retractile. The generative aperture is at the usual place on the right side, the vent being distant, near the back.

CHIORERA LEONINA (Gould).

Corpus albidum, aurantiaco subtiliter reticulatum; cirrhi labiales aurantiaci: lobi branchiales incolorati, aurantiaco venosæ: solea incarnata.

Body limaciform, smooth and of a pearly and whitish colour, finely reticulate with orange. The head is enormously enlarged, with a distinct neck, semiglobose, the oral face flattened. The oral fissure is longitudinal, the lips large, with the true mouth within at the posterior portion; around the edge of the oral disk or cowl is a double series of orange-coloured cirrhi, each of which has an independent motion. On the top of the head are two foliate expansions, destitute of venations, which answer to the true tentacles; on their anterior edge is an opaque, whitish papilla, presenting something of a spiral or lamellar structure; they were sometimes wholly retracted within a permanent sheath. Along the junction of the dorsal and lateral regions on each side is a series of six foliaceous, branchial expansions, or nutritive cæca, somewhat sinuous at margin, and attenuated at base, in which brownish vascular ramifications are plainly seen. The foot is smooth, flesh-coloured beneath, separated by a large fissure from the body, and folding longitudinally. Heart seen to pulsate at the middle of the back.

Length five and a quarter inches; breadth of foot three-fourths of an inch; of body, an inch and a quarter; diameter of head an inch and five-eighths; height of body one inch.

Dredged by Mr. Dyes, in three fathoms water, at Port Discovery, Puget Sound.

This animal swims by lateral flexions of the body, the foot being then folded; and when crawling it is able to flex its enormous head laterally with considerable force.

Figure 404, lateral view of the animal; 404 *a*, ventral view; 404 *b*, part of the circle of oral cirrhi, enlarged.

Several nudibranchiate Gasteropods were observed in the Oregon region, but none of them were figured or described in sufficient detail to furnish specific characters. They are interesting, however, as showing the correspondence of the generic forms in the northern Pacific and northern Atlantic waters.

One species of *DENDRONOTUS* was obtained in Puget Sound, with the tips of the branchial tufts white.

A *GONIODORIS* of large size was also found at the same place.

A *DORIS* with a thick coriaceous skin, and coarse, white tubercles, dark in the intervals, resembling the tip of the arm of an *Arterias*.

An *EOLIS* with a single row of branchial papillæ near the margin of the foot, leaving the dorsal region entirely exposed.

Both from Puget Sound also.

UMBRELLA INDICA of authors.

ANIMAL somewhat hexagonal, spreading far beyond the shell, the exposed portion covered with very prominent tubercles of different sizes, growing smaller towards the margin, cream-coloured, with olive shadings in the fissures, increasing towards the margin. Branchiæ laciniated and fimbriated, orange-coloured; upper tentacles tubular, truncated at tip, slit at the side, breadth one-third their length; eyes on large tubercles at their inner base. When the head is extended, a

smooth, orange-coloured, crescentic area appears in front of the shell, which is evidently covered by the shell when retracted. Mouth far behind the anterior limit of the animal; lips circular and corrugated, and surrounded by oblong radiating foliations.

According to notes made by Dr. Pickering, there seemed to be none of the numerous stomachs of *Aplysia*. The genital orifice seemed to be near the base of the right tentacle, though no external opening was discovered, nor any groove as in *Aplysia*; but the internal organs were seen to be voluminous. Vent at the opposite end of the body, tubular and projecting; heart on the forepart of the back, with a strong muscular ventricle. Pharynx large, and provided with very powerful muscles like fowls' gizzards; throat very large, and lined for some distance by a tough membrane, having numerous fine, enamelled rugæ adapted for rasping and triturating food. Intestinal canal short, with a ligamentous enlargement or stomach at its anterior portion; rectum filled with a substance resembling sponge, perhaps a hydrophyte. Its relations would seem to be with *Pleurobranchus* rather than with *Natica* or *Aplysia*.

Obtained at the Sandwich Islands, by Mr. Drayton.

In the Voyage of the *Bonite* (pl. 27), the animal of *Umbrella Indica* is represented as blotched with chlorine green, not tuberculated; the branchiæ as white and not projecting beyond the shell; the tentacles as acute, with no projecting lobes in front; beneath straw-coloured, and with the shell more rounded. The shell of this animal grows to a very large size, is quite solid and heavy, coarsely striate within, and usually deep golden yellow. It is probably different from the true *U. Indica*, and might bear the name employed by Gmelin, of *U. umbellata*.

Figure 408, dorsal view of the animal and shell; 408 *a*, anterior portion of the animal beneath, showing the mouth.

CHITON QUERCINUS (*Gould*).

Testa depressa, ovalis, vix carinata, quercina, maculis olivaceis nubeculata; valvis subrostratis; arcis lateralibus vix elevatis, longitudinaliter

sulcatis, sulcis incumbentibus et sulco radiante bisectis; areis centralibus ad latera lineis rugosis longitudinaliter sculptis, ad dorsum punctatis; valvâ anteriori sulcis concentricis et sulcis radiantibus remotioribus decussatâ; valvâ posteriori prope marginem umbonatâ; margine lato, pruinoso, flavescente.

Chiton quercinus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 142. July 1846. Expedition Shells, 3.

SHELL small, depressed, slightly carinate and beaked, ovate, yellowish wood or oak colour, clouded with olive or dusky slate-colour at the sides. Lateral areas scarcely raised, but distinctly marked by coarse longitudinal sulci, which are divided by a radiating furrow and sometimes more, and the two portions form somewhat of an angle with each other; central areas with faint, rugose, longitudinal lines towards the margin, and scattered punctures about the apex; anterior valve checked with raised spaces formed by concentric and more distant radiating furrows, which become more numerous near the margin; posterior valve with the umbo nearly terminal, so that the transverse ridge runs nearly parallel to the margin. Marginal ligament broad, yellowish, pruinose.

Length seven-eighths of an inch; breadth three-fifths of an inch.

Inhabits New South Wales. From Mrs. Mitchell.

It is allied to *C. foveolatus*, Sowerby.

Figure 437, the back of the shell; 437 *a*, the sculpture, magnified.

CHITON MUSCOSUS (*Gould*).

Testa ovalis, depressa, scabra, ad dorsum obtusa, cinereo bifasciata et plumosè striata; valvis magnis, lateraliter disjunctis; areis lateralibus parvis, granulis subquadratis radiantibus arcuatim tessellatis; areis centralibus sulcis acutis confertis flexuosis subparallelis longitudinaliter aratis; valvâ anticâ magnâ, semicirculari, decemcostatâ et granulis subquadratis insculptâ; valvâ posteriori parvâ, costâ transversali

inconspicuâ subterminali: margo latus, filis corneis inequalibus muscosis indutus.

Chiton muscosus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 145. July 1846. Expedition Shells, 6.

SHELL depressed, rather broad-oval, obtusely ridged along the back, everywhere sculptured. The colour is pale olive, ashy about beaks, and with an ashy-white band along each side of the dorsal ridge. Valves large, narrowing towards the sides, so that their edges do not come in contact; the lateral valves are small, slightly raised, coarsely granulated with square granules arranged in radiating lines; central areas deeply incised with sharp, flexuose, but nearly parallel ridges, the presenting edges of which are slightly denticulated; these are arranged along the back in a plumosely diverging series, and over the rest of the spaces they are nearly longitudinal; the spaces intervening between the ridges are indented with little alveoli. The anterior valve is large and semicircular, having about ten radiating, raised lines, and granulated like the lateral areas; posterior valve very small, partially umbonated near its extremity, where it is crossed by a faint, transverse ridge, nearly parallel with the margin. Margin broad, covered with coarse, moss-like, horny fibres or threads, of unequal size and length, flexible when wet, very brittle when dry.

Length two inches; breadth an inch and an eighth.

Inhabits Puget Sound, Oregon.

Allied to *Ch. brevispinosus*, which is much less and very differently sculptured, and has stiff, short spines on its margin. The shell figured by Mr. Reeve (Conch. Icon., fig. 136), under the name of *C. Collieri*, seems to be the same species; my description was published in May 1846, a year before that of Mr. Reeve. He says it is the same as *C. setosus*, Sowerby, in Beechey's Voyage. If so, I should consider the first two to be different, as that shell agrees well with a by no means rare species from Cape Horn.

Figure 436, view of the back of the shell.

CHITON INCANUS (*Gould*).

Testa solida, oblongo-ovalis, valdè convexa, cinereo et nigro variegata, concentricè undulato-striata, granulis sparsis nigris aspersa, ad dorsum subcarinata et longitudinaliter nigro bifasciata; areis lateralibus vix distinctis: margo aculeis inequalibus curtis curvatis nigris et canescentibus indutus.

Chiton incanus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 145. July 1846. Expedition Shells, 6.

SHELL solid, elongated oval, slightly narrowed anteriorly, convexly elevated and slightly carinated along the back. General colour a hoary white, here and there clouded with black, and with an interrupted black stripe each side of the summit. The surface is very minutely and irregularly granulated, so as to appear rugose under the lens; occasionally, and more especially on the lateral areas, these granules are shining jet black, so that the surface, when closely examined, appears sprinkled with isolated black dots. The valves are concentrically striated, the striæ a little undulating, deep, distinct, and somewhat imbricated at the anterior margin, becoming fainter at the apex and sides. The lateral areas are very slightly raised, not distinctly defined, and with faint indications of a few radiating lines; a few, minute, radiating lines may also be seen on the central areas, near the margin. Margin rather broad, clothed with short, unequal, slightly curved, black, and hoary spines, which are generally disposed in alternate clusters of black and white. Interior pale red and violet, somewhat iridescent.

Length an inch and three-tenths; breadth three-fourths of an inch.

Inhabits New South Wales, Australia. From Mrs. Mitchell.

Like *C. piceus* in general colouring and appearance, and still more like *C. petholatus*, which has a hairy margin.

Figure 432, back of the shell; 432 *a*, details of sculpture, magnified.

CHITON PRUINOSUS (*Gould*).

Testa parva, oblongo-elliptica, convexo-elevata, subcarinata, coloribus variis olivaceis, cinereis, et fusco-rubris irrorata et maculata; areis centralibus sub lente omnino quincuncialiter punctatis; areis laterali-bus longitudinaliter imbricato-striatis: intus virescens: margo minutissimè granulatus, coloribus fuscis et cinereis tessellatus.

Chiton pruinus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 144. July 1846. Expedition Shells, 5.

ANIMAL "with the foot and head a warm flesh-colour beneath, the latter small, the buccal mass almost circular, only a little tubercle on each of the sides next the foot. Lateral portion of foot and head a dark brown; branchiæ interrupted behind, of a clear, transparent red. Inside of margin a greenish ochre." [J. P. C.]

SHELL small, elongated, nearly elliptical, convexly elevated, subcarinate, or rather somewhat doubly carinate along the back; surface generally covered with microscopic punctures, arranged in lozenge. Lateral areas very slightly raised, and longitudinally imbricate-sulcate; central areas with faint lines of growth and punctures in quincunx; anterior valve concentrically striate, not punctate; posterior valve slightly umbonate, and crossed by a transverse ridge, behind which it is concentrically striate. It is frosted or mottled with dark brown, ash, purple, green, &c. Margin minutely granulated, so as to look hoary.

Length seven-tenths of an inch; width seven-twentieths of an inch.

Found on stones off Fort Santa Cruz, Rio Janeiro in two or three fathoms water.

Mr. Couthouy remarks as to the coloration, "some specimens are of a uniform pale green, margin clouded with dark green; some had two or three distinct, white blotches on the sixth valve, the rest of the shell being olive-green, with a line of faint green along middle of back; another had the ground-colour a clear olive, three dark brown spots bordered with white on each side of posterior margin of valves, a row of similar spots surrounding the terminal valves just above insertion, and

the whole surface sparsely and irregularly spotted in the same way, so as to present a delicately mottled aspect. A fourth variety was of a uniform dark rose-colour, and the margin clouded with dark red bands. Internally it was dark red or rosy along the middle, and dull yellow towards the sides. All the other varieties were of a pale greenish hue internally."

The sculpture of this very variably coloured species is sufficiently characteristic. Between the striæ are usually found minute pores, probably produced by some parasite.

Figure 419, profile of the shell; 419 *a*, ventral view; 419 *b*, details of sculpture, magnified.

CHITON JUGOSUS (*Gould*).

Testa ovalis, carinata, tectiformis, nitida, coloribus pallidè et saturatè herbeis variegata; valvis planulatis, ad apices adunco-acuminatis; areis lateralibus prominentibus, et lineolis confertis parallelis viridibus longitudinaliter notatis; areis centralibus sulcis acutis parallelis longitudinaliter aratis, sed ad verticem simplicibus et minutissimè punctatis; valvâ anteriori concentricè lineolatâ; valvâ posteriori umbonatâ, prope marginem concentricè lineolatâ, præter aream terminalem triangularem luteolam; margine granulato, fasciis cæruleis et viridibus limbo: intus pallidè virescens.

Chiton jugosus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 142. July 1846. Expedition Shells, 3.

SHELL of moderate size, oval or very slightly narrowed in front, sharply ridged upon the back, and declining on each side in a roof-like manner. Colour mottled with various shades of grass-green and yellow, sometimes the yellow predominating. The summits of the valves are very entire, pointed and incurved; the lateral areas are prominent, sharply defined, polished and regularly striped with crowded, parallel, alternately light and dark lines, which at first sight have the aspect of fine, longitudinal furrows; the central areas are deeply furrowed at the sides with about twelve coarse, sharp, parallel, longitudinal furrows, which are gradually curtailed so as to leave the vertices smooth or rather minutely punctured in quincunx. Anterior

valve concentrically lineated; posterior valve with a prominent, central umbo, crossed by a delicate transverse ridge, behind which is a small, smooth, triangular space pointing to the umbo, which is yellow and smooth, and the remainder is concentrically lineated like the anterior valve. Margin rather narrow, banded with dark green and sky-blue granules. Interior pale greenish-white.

Length one inch; breadth three-fifths of an inch.

Inhabits New South Wales. Presented by Mrs. Mitchell.

General aspect like *C. Siculus*, which, however, has radiating lines on the lateral areas. The coloration reminds one of the Gibraltar limestone, and the peculiar triangular area on the posterior valve, and the beautifully lineated, lateral areas, strongly characterize this shell. The lines on the lateral areas are about twice as numerous as the sulci on the central ones. The posterior smooth area bears some analogy to the fissure in *C. incisus*. It is also allied to *C. Stangeri*, REEVE; Conch. Icon., f. 150.

Figure 430, dorsal view of the shell.

CHITON VIRIDULUS, (*Couthouy MS.*)

Testa tenuis, oblongo-ovata, dilutissimè olivacea, ad dorsum sub-carinata, utrinque sub-canaliculata, ubique sub lente quincuncialiter insculpta; areis centralibus et lateralibus parum distinctis; lineis incrementi prope marginem conspicuis; valvis terminalibus leviter radiatis: margo minutissimè squamatus.

Chiton viridulus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 144. July 1846. Expedition Shells, 5.

ANIMAL pale orange with a tinge of purple in the middle of the foot; branchiæ of short pyramidal leaflets; mantle minutely granulated above, cream-coloured beneath. [J. P. C.]

SHELL small, thin, oblong-oval, slightly narrowed anteriorly, of a very pale olive or drab colour. Dorsal line rather acute, with a faintly indented line at a little distance on each side. To the naked eye the shell appears smooth, but under a magnifier it is found to be everywhere punctured in quincunx. Central and lateral areas not distinctly

defined, but the latter are a little raised, and under a magnifier they usually exhibit two or three radiating striæ and conspicuous lines of growth; the central areas also have the dots in parallel, longitudinal lines, most marked at the margin, and becoming oblique at the centre. Terminal valves similarly marked, the posterior one very slightly beaked. Margin covered with pale, microscopic scales; within, very pale green.

Length three-fifths of an inch; breadth seven-twentieths of an inch.

Inhabits Orange Harbour.

This is a narrow, elongated species, somewhat of the form of *C. longicymba*, but I am not able to find any description to which it corresponds in sculpture.

Figures 413, 413 *a*, dorsal and ventral views of the shell; 413 *b*, branchiæ; 413 *c*, a single branchial plume.

CHITON FRUTICOSUS (Gould).

Testa ovalis, valdè elongata, transversim arcuata, omnino textiliter punctata, olivacea, maculis minutis saturatioribus fulgurantibus variegata; valvis haud rostratis; areis lateralibus prominentibus, et lineis elevatis interruptis ramosis radiatis; areis centralibus lineis longitudinalibus rugosis, ad latera profundis, ad dorsum evanidis et arcuatis sculptis; areâ posteriori magnâ, umbonatâ, lineis inconspicuis, interdum divaricatis, radiatâ: intus flavo-olivacea: ligamentum latum, pallidum, minutissimè granulatum.

Chiton fruticosus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 142. July 1846. Expedition Shells, 4.

SHELL much elongated, and very little narrowed at extremities, arched from side to side, destitute of a keel or beaks. Colour a dirty olive, yellowish along summits and variegated with small, purplish-coloured spots, arranged somewhat in zigzag, and generally a lighter stripe along each side. Lateral areas prominent and deeply sculptured, leaving undulating, branched, interrupted rays; central areas deeply sculptured near the ligament with longitudinal, rugose lines, which become smaller upwards, so that the dorsum appears at first

sight to be smooth, but on closer examination, the lines are found to cross over from side to side in a curved manner, so as to form a most delicate web, and causing the granules sometimes to appear to have a zigzag arrangement; posterior valve large, with a prominent central umbo, the marginal portion with the raised, interrupted, branched radiating lines; anterior valve with fine, radiating lines, sometimes divaricate; whole surface covered with fine punctures. Margin broad, pale, with dusky patches, most minutely granulated. Interior yellowish-green. Marginal ligament broad, pale, minutely granulated.

Length an inch and a half; breadth five-eighths of an inch.

Inhabits New South Wales. From Mrs. Mitchell.

In general appearance, especially in the sculpture along the back, it is like a shell figured in the Conchological Illustrations by Mr. Sowerby, under the name of *C. solea*, and afterwards said to be a variety of *C. Indicus*. But it has no ramose sculpture on the lateral areas.

Figure 428, back of the shell; 428 *a*, details of the sculpture, magnified.

CHITON PLATESSA (*Gould*).

Testa parva, tenuis, elongato-ovalis, transversim arcuata, citrino-olivacea, ubique minutissimè punctata; areis lateralibus parvis, vix elevatis, lineis duabus vel tribus inconspicuis striatis; areis centralibus lineis confertis acutis granulatis arcuatim decussatis; valvâ posticâ magnâ, obscurè radiatâ; margine virente, fusco tessellato, minutissimè granulato: intus cæruleo-virescens.

Chiton platessa, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 143. July 1846. Expedition Shells, 4.

SHELL rather small and thin, oval, much elongated, transversely arched, of a yellowish olive colour, minutely punctured in quincunx at every part. The valves are flattened, without beaks or keel, the tips denuded; lateral areas very small, striated with two or three radiating lines; central areas with very fine, sharp, granulated, longi-

tudinally arcuated lines, like jeweller's engine-work; posterior valve large, faintly radiated. Margin covered with granules so minute as scarcely to be distinguished by the naked eye, chequered green and dusky. Inside bluish-green.

Length seven-eighths of an inch; breadth nine-twentieths of an inch.

Inhabits New South Wales.

Similar in its general aspect to *C. fruticosus*, but smaller, smoother, and the sculpture of the lateral areas and terminal valves entirely different. It is almost exactly like fig. 67 of the "Conchological Illustrations," which is said to be a variety of *C. longicymba*. In form it resembles *C. catenulatus*, Sowb.

Figure 431, back of the shell; 431 *a*, details of the sculpture, magnified.

CHITON DENTIENS (*Gould*).

Testa minima, ovata, carinata, olivacea, ad dorsum albido fulminata, omninò minutissimè granulata; areis vix distinctis; valvis rostratis postice subdenticulatis, dentibus albidis: margo pruinosis.

Chiton dentiens, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 145. July 1846. Expedition Shells, 6.

SHELL minute, ovate, carinate, dark olive, with fine, white, zigzag markings along the back, and dotted black and white along the posterior edge of the valves, the white portions seeming to project like minute teeth. The whole surface is minutely granulated, and faintly marked by the lines of growth. Lateral areas faintly defined, but occasionally marked by a dividing line; terminal valves like the others. Margin clothed with hoary pubescence.

Length one-fifth of an inch; breadth three-twentieths of an inch.

Inhabits Puget Sound, Oregon.

Much like *C. alternatus*, Sowb., which, however, has radiating ribs upon its lateral areas and terminal valves.

Figure 433, dorsal view of the shell, enlarged; 433 *a*, details of sculpture, magnified; 433 *b*, natural size.

CHITON INTERSTINCTUS (*Gould*).

Testa parva, rotundato-ovalis, vix carinata, rubricata, ubique quincuncialiter punctata; valvis ad apicem acutis, lineâ elevatâ luteo-maculatâ divisâ, areis lateralibus et valvis terminalibus juxta marginem plicatis: margo coriaceus granuloso-squamosus.

SHELL minute, oval, rather broad, of a flesh-red colour, everywhere minutely punctured in quincunx. Valves narrow, slightly pointed at their apex, the lateral and central areas separated by a raised line, having two faint yellowish spots on each side and another at the apex, only seen on careful examination. On the lateral areas near the margin are three or four obtuse folds, reaching about halfway to the apex: these are continued round on the two terminal valves; posterior valve semicircular, with a slight umbo near the preceding valve. Margin red, covered with minute, granular scales; marginal fissures of the anterior valve ten or eleven, with corresponding rays on the interior. Interior bluish-white, rusty at the centre.

Length half an inch; breadth three-tenths of an inch.

Found at Puget Sound, Oregon.

A very small species, about the size and colour of *C. castaneus*, but may be recognised by the plaited border and the yellow spots on the line dividing the areas; some specimens, however, are more bronzed, and without the yellow flecks. It has the size and many characters of *C. Sitchensis*, Middendorff.

Figure 423, dorsal view of the shell; 423 *a*, details of sculpture; 423 *b*, three valves, enlarged.

CHITON VESPERTINUS (*Gould*).

Testa parva, sub-ovata, carinata, thalassina, intus rosacea, punctis triangularibus insculpta; areis lineâ elevatâ divisis; valvâ anticâ lineis radiantibus octo notatâ; valvâ posticâ parvâ, ad apicem emarginatâ, propè marginem umbonatâ; margine coriaceo, pilis raris induto.

SHELL oblong, slightly ovate, carinate, deep sea-green, interior rosaceous at apex; the valves acutely pointed at apex, waved by stages of growth, areas divided by an elevated, smooth, or slightly undated line, and with a similar line at the posterior margin of the valves; both areas conspicuously punctured with triangular points, arranged for the most part along the lines of growth, and also having a radiating arrangement, the dorsal areas most punctured; anterior valve having eight delicate, raised, radiating lines, with corresponding undulations at the margin, one to each marginal fissure; posterior valve small, emarginate at tip; apex a minute point near the margin, sculptured with the lines of growth, rather than with the punctures; margin coriaceous, bearing a few, scattered, flaccid hairs, which would scarcely be detected in the dried state.

Length an inch and a quarter; breadth seven-tenths of an inch.

Inhabits Puget Sound, Oregon.

Allied to *C. Hindsii*, Reeve, and *ciliatus*, Sowb., in the form of the posterior valve, and very closely to the latter in size, colour, and the arrangement of sculpture; but in that shell the points are represented as granules, whereas in this they are decidedly triangular punctures; and moreover, the difference of locality (New Zealand) would preclude the supposition of their identity. I suspect that some varieties are nearly impunctured, and, indeed, may be varieties of *C. Merckii*, Wosnessenski.

Figure 426, back of the shell; 426 *a*, profile.

CHITON PUNICEUS, (*Couthouy MS.*)

Testa parva, oblongo-elliptica, elevata, ad dorsum carinata, punctatissima, punicea, gradibus ætatis conspicuis obtusis signata: areis lateralibus præruptè elevatis, et sparsim granulatis; areis centralibus costulis longitudinalibus parallelis ad sex, plerumque ad medium dislocatis, clathratis; valvâ posteriori rostro parvulo acuto et septo transversali notato: ligamentum minutissimè imbricatum, adversum suturas albido fasciatum.

Chiton puniceus (COUTHOUY MS.); Proceed. Boston Soc. Nat. Hist., ii. 143. July 1846. Expedition Shells, 5.

ANIMAL with the head large, distended on each side into a sort of lappet. Foot large, oval, flesh-colour; branchiæ small, appearing like a series of small tubercles, and only extending from midway of the foot to the anal canal, pale ochreous.

SHELL small, thin, elongated, elliptical, elevated, and sharply carinated along the back, of a dull rose, or bright brick-red colour, and everywhere minutely punctured. The lateral areas are very abruptly and distinctly elevated, regularly ridged by the obtusely rounded stages of growth, and bearing a few scattered granules. Central areas with the lines of increase well marked, and remarkably barred with about six elevated, longitudinal, parallel ridges, which are generally dislocated about the middle by some of the lines of increase. The posterior valve has a very minute, and acute, nearly central umbo, with an abrupt depression passing transversely through it; the margin is very minutely imbricated by prismatic scales, coloured like the shell, and with yellowish bands crossing it, opposite to the junctures of the valves.

Length half an inch; breadth three-tenths of an inch.

Inhabits Orange Harbour, Tierra del Fuego.

In colour and shape it resembles *C. ruber*, but is larger and differently sculptured, and remarkable for the series of parallel ridges on the intermediate areas.

Figures 412, 412 *a*, dorsal and ventral views of the shell; 412 *b*, details of sculpture; 412 *c*, branchiæ; 412 *d*, a single branchia, enlarged.

CHITON JASPIDEUS (*Gould*).

Testa ovata, tenuis, carinata, ubique minutissimè punctata, coloribus rosaceis plus minusve saturatis picta; areis centralibus lineis minutis granosis confertissimè striatis; areis lateralibus indistinctis, et lineis tribus vel quatuor sparsim granosis radiatim notatis; valvis terminalibus granoso-striatis, posticâ excavatâ; margine coriaceo, pruinoso.

Chiton jaspideus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 143. July 1846. Expedition Shells, 4.

SHELL broad-ovate, thin and light, somewhat strongly carinated; under a magnifier it is found to be everywhere punctured in quincunx. It is generally dark liver-red, clouded with longitudinal pencillings of more or less deep rose-red colours; central areas closely and minutely marked with granulated, longitudinal lines; lateral areas small, distinguished by their greater smoothness, and having four or five rather imperfect granular lines upon them; terminal valves with radiating lines of distant granules, the posterior one excavated and with a transverse ridge, and strongly marked with the lines of growth. Margin coriaceous, covered with short, hoary down.

Length one inch; breadth seven-tenths of an inch.

Inhabits Callao.

Resembles in size, shape, and sculpture *C. apiculatus*, Say, but the sculpture is much more delicate, and the colour, resembling some varieties of jasper, is quite distinctive. Were it not that Mr. Reeve could scarcely have given the sculpture of *Ch. cerasinus*, Chem., so simple, compared with the systematic arrangement of granules on this shell, we might, from general appearances, regard the two as identical.

Figure 414, the shell, above; 414 *a*, details of sculpture, enlarged.

CHITON ASPERRIMUS, (*Couthouy MS.*)

T. minuta, elongato-ovata, convexiuscula, subcarinata, fusco-olivacea; areis lateralibus conspicuis, papillis sparsis columnæ-formibus obsitis; areis centralibus papillis similibus longitudinaliter dispositis ornatis: ligamentum coriaceum, pubescens.

ANIMAL with the head, foot, and margin pale yellow; duplication of the mantle above the branchiæ of a deeper yellow; branchiæ pale orange; buccal mass broad and fleshy, prolonged into lobes inferiorly.

SHELL elongated-oval, narrowed anteriorly, moderately convex, subcarinate, brownish-olive along the back, with a lilac bloom at the margin; posterior valves semilunar; lateral areas large, extending quite to the anterior edge of the valves, ornamented with irregularly scattered, cylindrical eminences, which are easily detached, leaving a scar; the central areas have thickset, longitudinal ranges of similar eminences. Margin coriaceous, covered with short and scattered setæ.

Length one inch; breadth two-fifths of an inch.

Obtained at Ilha do Pai, at the entrance of the harbour of Rio Janeiro. [J. P. C.]

The peculiar character of the granulations, like little cylindrical pedestals, is alone enough to identify the species.

Figures 418, 418 *a*, dorsal and ventral views of the shell and animal; 418 *b*, details of sculpture, enlarged.

CHITON CASTANEUS, (*Couthouy MS.*)

T. minuta, elongato-ovata, subcarinata, castanea, lineis incrementi porcata, minutissimè quincuncialiter punctata; margo angustus coriaceus, pubescens, fasciculis setarum viginti-sex instructus.

ANIMAL with the under side of the margin pale brick-red; foot nar-

row oval, dull olive colour; head small, and laterally compressed; branchiæ pale ochreous-red, extending from the anterior margin of the foot to the rectum, leaflets conical, compressed, tapering to a fine point.

SHELL minute, elongated-oval, slightly narrowed anteriorly, sub-carinate, valves obtusely beaked, without distinct lateral areas, but marked throughout with coarse, sub-laminate ridges of increment, and covered with minute punctures arranged in quincunx; posterior valve with an obtuse umbo. Colour externally deep chestnut, internally dull red. Margin narrow, thin, coriaceous, finely pubescent, having at the inner margin twenty-six fascicles of short, rigid, shining white setæ, looking like minute polished tubercles.

Length three-tenths of an inch; breadth one-tenth of an inch.

Found on old shells and in tide-pools, Orange Harbour. [J. P. C.]

A small, but very distinct species. Most of the specimens were considerably eroded, showing that they had come to maturity.

Figures 411, 411 *a*, shell and animal, above and below, enlarged; 411 *b*, branchiæ, enlarged; 411 *c*, branchia, still more magnified.

CHITON CONFOSSUS (*Gould*).

Testa parva, ovata, fastigiata, pallida, roseo et incarnato concinnè variegata; valvis rostratis; areis lateralibus elevatis, serie posticâ squamârum et serie obliquâ squamârum majorum ad apicem spectantium finitis; intervallo lævigato, et granulis paucis annulatis sparso; areis centralibus plerumque lævibus sed punctis sparsis triangularibus retrospectantibus confossis; valvâ posteriori valdè gibbosâ, umbone ferè terminali, dentibus insertionis novem et ad valvam anteriorem viginti-quinque, pectinatis: margine fusco, carnoso.

Chiton confossus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 143. July 1846. Expedition Shells, 5.

SHELL small and delicate, ovate, with a well-marked, dorsal ridge,

of a pale cream-colour, delicately variegated with rose and flesh-colour, often producing checks along the edge of the valves and reticulations at the margin; valves strongly beaked, the lateral areas raised and bounded by an obtuse, elevated line, which is laminated in triangles pointing towards the apex, and another line of similar laminæ sculpts the posterior margin; the intervening space is smooth, but with a few, scattered, impressed rings, each including a granule; central areas in general smooth, but pierced with minute though distinct triangular punctures pointing backwards; posterior valve with a remarkably gibbous beak, by which at least a right angle is formed, crossed by a transverse band, before which the valve is punctured, and behind it slightly scaly and minutely dotted in quincunx; anterior valve somewhat radiately squamose and granulated; teeth of insertion nine, and of the posterior valve twenty-five, all delicately pectinated. Margin dark, not granulated.

Length five-eighths of an inch; breadth three-eighths of an inch.

Inhabits the Feejee Islands.

Allied to *C. sculptus*, Sowb., which has three lateral rays and the central areas smooth. But it is altogether dissimilar from other described species.

Figure 434, superior view of the shell; 434 *a*, details of sculpture, enlarged; 434 *b*, profile of the extreme valves, with their denticles.

CHITON PETALOIDES (*Gould*).

Testa parva, tenuis, ovalis, arcuatim elevata, subcarinata, dilutè citrina; areis lateralibus elevatis, rugosè granulatis, et striis radiantibus ad quatuor insculptis; areis centralibus longitudinaliter rugosè granulato-punctatis, et lineolis tenuissimis angulatis dilutè violaceis pictis; valvâ posteriori acutè umbonatâ et costâ transversali divisâ: margo stramineus, minutissimè granulato-imbricatus.

Chiton petaloides, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 144. July 1846. Expedition Shells, 6.

SHELL small, delicate, elliptical, roundly arched, very slightly cari-

nated, the valves not beaked, of a pale lemon-yellow ground colour, reticulated along the centre, with delicate, angulated, pale-violet lines; these areas are also rugosely lineate-punctate longitudinally, especially toward the margin; lateral areas very prominent, rugosely granulate, and with about four, fine, radiating striæ; posterior valve acutely umbonated and crossed by an acute, transverse rib. Margin cream-coloured, very finely granulate-imbricate.

Length half an inch; breadth two-fifths of an inch.

Inhabits Kauai and Oahu, Sandwich Islands.

A very delicate and beautiful shell, its markings resembling the venated petals of some flowers. I know of no other species nearly resembling it.

Figure 435, back of the shell; 435 *a*, the sculpture, magnified; 435 *b*, natural size.

CHITON DISJUNCTUS (FREMBLY), Zool. Journ., iii. 193. REEVE; Conch. Icon., f. 21.

The margin of this species is nearly as broad as the valves, except posteriorly, where it is narrowed and distinctly cleft. It has a rich mahogany colour, banded at irregular intervals with series of light-coloured oval dots; over the whole are sprinkled clusters of small azure and green specks, making the margin very brilliant and beautiful. Under side dark ochre passing into red. Branchiæ very large and thick, extending to near the anus; anal tube large and prominent. Head large, the frontal veil separated from the buccal mass by a deep sinus, prolonged on each side into a compressed conical lobe. [J. P. C.]

Taken at Villamar, Chili, where it attains a large size.

Figure 417, the animal from beneath.

CHITON ATRATUS (SOWERBY), Mag. Nat. Hist., 1840. Conch. Illustr., f. 57, 58. REEVE; Conch. Icon., 103.

ANIMAL with the foot of a clear ochreous red, darkest at the margin; head rather paler, mouth not surrounded by a veil or hood, but sunk in the centre of the cephalic mass, the labial dilatations scarcely apparent; branchiæ of a darker colour, continued to the anal tube; under surface of the margin clear orange. In some individuals the foot is flesh-coloured, and the margin roseate: this variety is barred lake and orange above. In others, the foot is ash-coloured, and the margin barred dark purple and cinereous.

The SHELL exhibits a great variety of colours, from a uniform dark chestnut and purple banded, to a pale green, with roseate or pale green bands. Scarcely any two are alike; most varieties turn darker on drying. They were peculiar for being always remarkably clean, while other species in the same pools would be loaded with zoophytes and Fuci.

It is allied to *C. Bowenii*, King, but it never becomes black or is destitute of marginal bars. The margin has a slight velvety feel when fresh, becoming horny when dried. [J. P. C.]

Found in pools at Orange Harbour.

Figure 415, the under side of the animal.

CHITON LIGNOSUS (GOULD), Proceed. Boston Soc. Nat. Hist., ii. 142. Expedition Shells, 3.

There can be little doubt that this is *Chiton Merckii*, Middendorff, in Mem. de l'Acad. des Sciences de St. Petersburg, Sciences Naturelles, vi. 179, tab. xi., figs. 5, 6. The margin, which was imperfect in our specimens, is described as "limbus pilosissimus, mediocris."

CHITON SETIGER (KING), Zool. Journal, v. 338, pl. 86, f. 5. REEVE; Conch. Icon., f. 48.

ANIMAL deep ochreous on the foot, deeper on the margin; head and branchiæ paler; sides of the foot pale orange; head in the form of a hood, having a thick, lappet-shaped prolongation on each side of the

mouth, susceptible of considerable extension, and supplying the place of tentacles. Branchiæ extending nearly to the anus; leaflets conical-compressed. [J. P. C.]

From Mr. Couthouy's observations it would seem that there is nothing during life which appears like the veil, "petite voile circulaire et plissée," described by Cuvier, the mouth being simply a rugous orifice in the middle of the head beneath. The branchial leaflets also are only triangular, as described by him, when they have been contracted by spirit. The pores from which the marginal setæ appear to issue are not disposed in three rows, as described by Captain King, but are scattered irregularly, the largest being at the inner margin and becoming smaller and more numerous towards the outer margin.

Found at Orange Harbour, and with them the variety considered by Captain King as identical with *C. Fremblyi*, Brod.

Figure 425, the animal from beneath; 425 *a*, profile view, with the shell; 425 *b*, branchia, enlarged.

CHITON VIOLACEUS (QUOY and GAIMARD), Voy. de l'Astrol., iii. 403, pl. 73, f. 15-20. REEVE; Conch. Icon., fig. 41.

ANIMAL dark-chestnut, tinged ferruginous above; margin beneath pale fawn-coloured, dotted crimson; foot dark ochreous; mantle pale slaty; hood semicircular, pale brick-red; mouth rather longitudinal; lips florid; branchiæ quite surrounding the foot.

On the margin of the shell are eight lateral and two cephalic tubercles, each bearing a few setæ at the centre.

Found at New Zealand.

Figure 420, the animal from beneath; 420 *a*, profile of the shell and animal; 420 *b*, sculpture of three valves of the shell.

CHITON PERUVIANUS (LAMARCK), Anim. sans Vert., vii. 491. REEVE; Conch. Icon., f. 50.

ANIMAL with the mantle above deep sap-green, beneath blue at the edge, passing into yellowish at the inner edge; foot ochreous; branchiæ olive, tipped bluish; hood very large and distinct from the head, spreading out into long angular wings on each side to the width of the foot; mouth transverse.

Figure 422, the animal from beneath.

CHITON LINEOLATUS (FREMBLY), Zool. Journ., iii. 204, p. 17, 7. REEVE; Conch. Icon., f. 34.

Margin of the mantle violaceous, mottled with dusky above, pale reddish-blue, edged with violet beneath; foot cream-coloured; branchiæ brown, extending five-sixths the distance to the anus.

Inhabits the Bay of Valparaiso.

Figure 416, the animal from beneath.

CHITON AUSTRALIS (SOWERBY), Mag. Nat. Hist., New Series, iv. 290, Conch. Illust., f. 46.

A series of specimens shows this species to be very variable in its sculpture, and there can be little doubt that the *C. evanidus*, Sowb. (ib. p. 291, C. Ill., f. 139), is one of these varieties, with which the specimens collected by the Expedition mostly correspond in form and colouring. In some small specimens the central areas are smooth, and the striæ on the lateral areas are somewhat granular; but in very old specimens the central areas are deeply furrowed with longitudinal striæ, which widely diverge at the sides. In all the varieties the striæ of the lateral areas are coarse, irregular, and repeatedly divaricating. The tips are always roseate; no specimens agree exactly with either of the descriptions, but the general features are so allied as to deter me from giving it a new name.

CHITON ZELANDICUS (QUOY and GAIMARD), Voy. de l'Astrol., iii. 400, pl. 72, f. 5-8. REEVE; Conch. Icon., f. 58.

ANIMAL beneath ochreous; foot oblong, narrowed posteriorly, rounded at ends, surrounded by the branchiæ; head long, transversely oval.

Figure 410, the animal beneath.

CHITONELLUS FASCIATUS (QUOY), Voy. de l'Astrol., iii. pl. 63, f. 21-29.

ANIMAL above buff-coloured, banded transversely opposite each of the valves with violet-purple; foot long and narrow, brick-red, margined with pale yellow; margin on each side broader than the foot, and of paler colour, with occasional darker, transverse bands. Branchiæ occupying the posterior third of the body; head circular; mouth corrugated, surrounded by a narrow hood.

Figures 429, 429 *a*, upper and under views of the animal.

CHITON JANEIRENSIS (SOWERBY), Conch. Ill., f. 56. REEVE; Conch. Icon., f. 80.

ANIMAL having the foot a dull-green colour, head rather paler, large and broad; mouth furnished with two, short, lateral, inferior appendages, like lobes, which give it the aspect of being surrounded by a hood. Branchiæ orange-coloured; duplication of the mouth dull yellowish-brown; under side of marginal extension yellowish. [J. P. C.]

Obtained from stones in two or three fathoms water, off Fort Santa Cruz, Rio Janeiro.

Figure 421, the animal, beneath.

CHITON COQUIMBENSIS (FREMBLY), Zool. Journal, iii. 197. REEVE Conch. Icon., f. 22.

ANIMAL with the foot elongated oval, ochreous yellow; margin yellowish, becoming purplish at the outer edge; branchiæ surrounding the foot; head semi-oval, dilating posteriorly, appearing distinctly hooded below.

Figure 427, under side of the animal.

PATELLA TALCOSA (*Gould*).

Testa magna, solida, ponderosa, rotundata, depressa, costulis radiantibus numerosis subequalibus rotundatis flexuosis instructa, vertice sub-centrali, colore saturatè cinnamomeâ; facies interna talcoso-argentata, purpureo tincta; callo centrali crasso, albo, spatulæformi, ad marginem radiato; impressione musculari lato, profundo: margo crenulatus.

Patella talcosa, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 148. July 1846. Expedition Shells, 6.

A large, ponderous, depressed, dome-shaped shell, the apex nearly central, covered with numerous small, nearly equal, rounded, flexuous, radiating ribs. Colour a deep cinnamon-brown; the interior has a light, silvery, mother-of-pearl lustre, with crimson reflections where the shell is thin, and with the unctuous feel of talc; the centre is occupied by a very thick, white, tongue-shaped callus, radiately dentate at its margin. Muscular impression very broad, very deeply impressed, and double. Edge slightly crenulated by the ribs.

Length four inches; breadth three and a half inches; height an inch and three-fourths.

Inhabits Hawaii, Sandwich Islands.

The colours of the interior, in small specimens, are very rich, and the shell is of a rounded, shield-like form, like *P. testudinaria*, attaining sometimes a very large size, larger than any other species except *P. pyramidata*. It seems to be somewhat common in collections, but I cannot identify it with any published description.

Figures 452, 452 *a*, 452 *b*, three views of the shell.

PATELLA CITRULLUS (*Gould*).

Testa depresso-conica, sub-equilateralis, translucida, extus rugoso-undulata, prope apicem lineis granuliferis radiata, pallidè olivacea, intus nitida, plumbea; fundo albido: apertura rotundato-ovata; margine expanso, acuto.

Patella citrullus, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 149. July 1846. Expedition Shells, 8.

ANIMAL. Tentacula short and stout; eyes on an enlargement at the external base; mantle of a pale green, darker at the edges, and finely crenulated, also irregularly marked by dark brown maculæ; back of head and neck dark-brown passing into green; tentacles the same colour, with black extremities. Branchiæ having the laminæ disposed in the form of slight scollops of a pale straw-colour; edges brown; foot flesh-coloured, with a median line of a hue inclining to red; mantle fringed with dark green. [J. P. C.]

SHELL sub-diaphanous, thin, sub-conical, moderately elevated, summit prominent; apex anterior, acute, feebly incurved, usually somewhat eroded; a great number of faintly elevated lines, studded with fine tubercles or asperities, radiate from it, and become obsolete about half-way towards the margin. Striæ of increment coarse and irregular, overlaying each other, so as to give the shell a rude, concentrically squamose aspect externally; disk nearly oval, a little narrowed anteriorly; margin very thin and sharp, finely and irregularly undulated. External colour a dusky olive-green, with a shade of brown showing through it, ornamented with concentric, undulating lines of obscure white. Interior greenish-white, with bright iridescent reflections; a slight spatulaform deposit at the fundus, bluish at the edges and forepart, passing into greenish towards the middle and posterior portions.

Length an inch and four-fifths; breadth an inch and one-fifth.

Inhabits the Madeira Islands, Funchal.

This shell resembles somewhat the skin of a cucumber, externally.

The radiating striæ occupy the upper half of the shell, and the lower half is somewhat imbricated by the stages of growth. It is somewhat like *P. Candei*, D'Orb.

Figures 448, 448 *a*, views of the exterior and interior of the shell.

PATELLA LUCTUOSA (*Gould*).

Testa obliquè conica, crassa, vertice eccentricâ, obscure olivacea, interdum sanguineo tincta, costis majoribus ad duodecim rotundatis, scabrosis, pallidis munita, minoribus quibusdam interjectis: apertura ovalis; margine crenulato: facies interna livida, reflexionibus succineis micans; limbo fasciis fuscis et albidis inequalibus alternantibus radiato.

Patella luctuosa, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 150. July 1846. Expedition Shells, 8.

SHELL thick, rough, and angular, apex near the front, obliquely conical, outline arched, the anterior outline approaching to perpendicular, of an obscure olive-green colour, sometimes mixed with purple. The surface has about twelve, ash-coloured, principal ribs, which are rounded, lighter coloured, and roughened with scales and tubercles; between two of these are two or three similar, but much smaller ribs, which in young specimens are tubercular, beaded alternately jet and white. Aperture broad-ovate; the interior is of a dusky leaden hue, with amber-coloured reflections; the central spatulate spot is of a uniform colour, or paler at the centre, and the remainder is radiated by golden rays answering to the large ribs, and broader dusky ones, sometimes subdivided by narrow white lines, answering to the secondary ribs; margin irregularly crenate, everted; base arched, so that the shell rests on its extremities.

Length an inch and a quarter; breadth one inch; height half an inch.

Inhabits New Zealand.

A small species, of unusually rough and irregular surface, and dull-

green colour, not unlike coarse specimens of *P. vulgata*. Its dark interior, radiated with yellow stripes of unequal length and breadth, and its brilliant umber-coloured and purple reflections, in fine specimens, quite rival *P. tramoserica*. It is also allied to *P. ornata*, Sowerby.

Figures 446, 446 *a*, 446 *b*, outer, inner, and profile views of the shell.

PATELLA SAGITTATA (*Gould*).

Testa tenuis, translucida, ovato-rotundata, depressa, fusco-viridis, nigro obscure radiata, subtilissimè granuloso-striata, apice antico, acuto, incumbente; margine integro: facies interna argentea, cum reflexionibus succineis, et interdum fusco radiata; fundo (luce transmisso) elegantissimè reticulato, et maculis sagittatis radiato.

Patella sagittata, GOULD. Proceed. Boston Soc. Nat. Hist., ii. 148. July 1846. Expedition Shells, 7.

SHELL thin, translucent, depressed, with an arched outline; apex at the anterior fourth, acute, projecting forwards; surface covered with regular, delicate, minutely granulated, radiating, and concentric striæ. Colour dusky olive-green, with obscure radiations of dusky; but if held up to the light the whole shell is found to be most beautifully reticulated and radiated with arrow-head, dusky spots, often articulating with whitish. Interior minutely radiate-striate, bluish-silvery, with some amber-coloured reflections, and occasionally with imperfect, dusky radiations; fundus more or less yellowish-green.

Length an inch and three-quarters; breadth an inch and one-tenth; height two-fifths of an inch.

Inhabits the Feejee Islands. *C. Pickering. J. Drayton.*

This delicate and beautiful species is allied to *P. testudinaria*, but is more depressed and much more delicate in all its characters, and its peculiar markings by transmitted light, like to some of the Navicellæ, distinguish it. The striæ in some specimens look undulated.

Figure 449, exterior of the shell; 449 *a*, profile of the shell; 449 *b*, the animal, as in motion; 449 *c*, the animal, from beneath.

PATELLA PIPERATA (*Gould*).

Testa scabrida, obliquè conico-depressa, olivacea, costato-striata, costis majoribus pallidioribus lineâ mediani saturationi interruptâ aspersis: apice eccentricâ, acutâ: apertura ovata; margine crenulato; facies interna livida, fundo ferrugineo, radiis albidis insigni.

Patella piperata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 150. July 1846. Expedition Shells, 8.

SHELL small, of moderate elevation, obliquely conical, apex at about the anterior third, acute and somewhat inclined forwards; exterior with numerous, coarse, unequal, granular striæ. Colour dull olive, with the larger striæ ash-coloured, along the middle of some of which runs a dark line, interrupted at short intervals, so as to give the surface a coarsely dotted appearance. Aperture rounded-ovate; margin crenulate; interior of a dull leaden or dark chestnut hue, tinged at the bottom with ferruginous, and rayed with yellowish.

Length an inch and one-fifth; width nine-tenths of an inch; height half an inch.

Inhabits Cape de Verd Islands and Madeira.

In some specimens the leaden hue prevails, in others the rusty; and there is the usual variety in form. One specimen, a large one, has the exterior of a greenish ash-colour, and the interior highly polished and beautifully radiated with chestnut and white, overlaid with golden reflections. It is somewhat like *P. scutellaris*, of the Mediterranean, especially within, but it is less elongated and the surface less ribbed. It is also near to *P. guttata*, D'Orbigny, from the Canary Islands.

Figures 449, 449 *a*, 449 *b*, outer, inner, and profile views of the shell.

PATELLA PAUMOTENSIS (Gould).

Testa solida, albido-cinerea, ovalis, depresso-conica, apice sub-centrali, costis acutis radiantibus inequalibus ad quaterdenis instructa: facies interna alba vel dilutè incarnata; impressione musculari callosâ, albâ vel citrinâ; areâ centrali ferrugineâ vel incarnescente: margo costis dentatus, spatiis intercostalibus fusco tinctis.

Patella Paumotensis, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 150. July 1846. Expedition Shells, 8.

ANIMAL with the locomotive disk oval, gamboge-yellow; head, tentacles, and mantle pale yellow; cirrhi of the mantle opaque-white; mouth reddish. Tentacles of moderate length and slender; eyes near the base; branchiæ interrupted at the head, arranged in a series of long, narrow, transversely striate lamellæ; marginal cirrhi peculiar in arrangement, disposed in twenty-four clusters of five each, viz., two short ones, arising from the margin like a filamentary extension of the mantle, two rather longer ones from midway on the inside of the mantle, and between these a fifth, twice the size of the others, which is tubular, as are probably the others. [J. P. C.]

SHELL rounded-elliptical, depressed conical, solid. Colour ashy-white; apex acute, one-ninth nearest the anterior end; surface with about forty unequal, acute, somewhat nodular ribs; muscular cicatrix unusually prominent, white or flesh-coloured, the included space rusty, especially near its margin, or occasionally tinted with rose-colour; marginal portion white or light flesh-coloured; margin somewhat regularly dentated by the prolonged ribs, the spaces between the ribs often more or less dusky.

A specimen from Rose Island measures in length an inch and two-thirds; breadth an inch and a half; height half an inch. One from Wilson's Island measures in length an inch and three-fifths; breadth an inch and a quarter: height three-fifths of an inch.

Allied to *P. tramoserica*, but its colours are generally dull and dead, instead of silky. Generally, eight or ten of the ribs are more promi-

nent than the rest. The prevailing colour of the interior is that of ripe muskmelon. Sometimes there are dusky spots between the ribs. It seems to be found at all the islands of the Paumotu Group, and as far as Taheiti.

Figures 441^o_a, 441^o_b, outer and inner views of the shell; 441^o_c, shell, with the animal; 441^o_d, animal, with the shell in profile; 441^o_e, branchia; 441^o_f, marginal cirrus.

PATELLA ILLUMINATA (Gould).

Testa inequilateralis, ovato-conica, fuliginosa, maculis sparsis flavidis translucidis illuminata, creberrimè radiatim costellata: apertura ovata; facies interna nigro-picea, sericeo splendens; fundo flavido.

Patella illuminata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 149. July 1846. Expedition Shells, 7.

SHELL elevated conical, with an arched outline, the apex at about the anterior fourth; surface covered with numerous small, obtuse, radiating ribs, with from one to three intervening striæ; concentric lines of growth crowded, very faint. Colour sooty, with scattered, yellowish spots, about twenty in number, somewhat regularly disposed, which are transparent when held up to the light, those near the margin elongated. Aperture ovate, the margin slightly irregular; interior a very dark claret-colour, with brilliant silky and golden reflections, and yellow spots, corresponding to those of the exterior; central spatula dull buff-colour.

Length an inch and a half; breadth an inch and a quarter; height three-fifths of an inch.

From the Auckland Islands. *Lieutenant Totten.*

This shell has the shape of *P. argentea*, and the interior like *P. tramoserica*. It is very like *P. cymbularia*, which, however, is finely striated and in no wise costate, more rounded and more depressed pyramidal; its margin broadly everted, and its spatula dark chestnut. It may be the young of what is figured by Quoy as *P. granularis*.

Figures 441, 441 *a*, 441 *b*, three views of the shell.

PATELLA CYMBULARIA (LAMARCK), Anim. sans Vert., vii. 541. LESSON; Voy. de la Coq., 422. *P. mytilina*, SCHUB. and WAGN.; Supp. Martini, f. 4052. *P. cymbuloides*, D'ORBIGNY; Voy. dans l'Amer. Merid.

ANIMAL. "Head very small and projecting, almost probosciform; tentacles long and rather stout; eyes extremely minute, near external base. Foot very regularly oval, rather broader anteriorly; mantle furnished with twelve prominent, retractile cirrhi, convex on the upper and flattened on the lower side; between each of which are three shorter and slender cirrhi. All these marginal cirrhi are constantly in motion, and it was observed that they corresponded in position to the sinuosities of the margin of the shell. Branchiæ in the form of a very narrow fringe, surrounding the body between the foot and the mantle, and hardly perceptible. Colour of head and tentacles pale brown; mantle the same colour, with a tinge of purple added; larger marginal cirrhi tinged with purple at the base, the others yellowish, as are also the branchiæ; the foot is pale slate-colour in the middle, and yellowish at margins. It appears finely granulated under a lens." [J. P. C.]

Found on a floating Fucus, in lat. 47° 80' S., long. 60° W.

Figure 442, the animal and shell, from below; 442 *a*, profile of the shell.

PATELLA DEAURATA (GMELIN), in Chemn. Conch., x. tab. 168, f. 1616, *a*, *b*. *P. Magellanica*, GMEL.; Chemn. Conch., i. tab. v. f. 40, *a*, *b*. *P. fusca*, DILLWYN; Catal., ii. 1047.

The varieties of this shell are so numerous that several species might easily be designated from them. The aperture is either oval or ovate, the long diameter being to the short diameter, varying from 23 : 20, to 11 : 5. In altitude compared with its long diameter it varies as 3 : 4, to 4 : 11; the elongated, narrow varieties being generally most depressed. In some, the apex is nearly central, and is acute. this is the case with those which have the aperture nearest approaching to circular, and also the greatest altitude, so that the shell

resembles an elevated cone. This form appears to be what has been named *P. Magellanica*, by Gmelin (Wood; Index, f. 69, *fusca*, CHEMN.; Conch., tab. 5, f. 10). The more depressed ones, with an anterior apex, may be such as are named *P. ferruginea* (Wood, f. 32). The external colour varies from a very dark slate, through brown to ferruginous, or dusky horn-colour. It is uniform in the majority of instances, but with the ribs darker than the interstices in some cases; the ribs are pretty uniformly thirty in number, usually irregularly alternating larger and smaller.

The interior is more commonly plumbaginous having the margin and central spatula very dusky brown, with golden reflections, and with more or less white callus at the inner margin of the muscular impression. Sometimes the whole interior is of this dark gilded brown; but it is rare that even then there is not some minute white spot near the muscular impression.

ANIMAL. "In all varieties, however, the animal is found precisely the same, except some little differences in the colour of the foot, as to depth of shade. The head, which is small for so large a Patella, is of a delicate rosy-white on the upper part, passing into colourless toward the neck and mouth. In front it is prolonged into a short proboscis, opening transversely in form of an ellipse, and forming a sort of margin above and around the mouth. Tentacles, long and taper, arise from about the middle of the head, and instead of being carried in a right line, they curve so as to resemble a pair of cow's horns in miniature. Colour yellowish-white, except a stripe of dark purple on their back, reaching from just above their base to tip. The eyes are very indistinct, on the back and near the origin of the tentacles. Foot nearly circular, very muscular, in general of a dark bluish slate-colour; mantle and branchiæ pale yellow. The latter surround the whole body like a delicate, fibrous fringe. The cirrhi with which the mantle is fringed are short, but conspicuous, purple at base, and yellowish at tip, and when contracted, resembling small, black points near the edge of the mantle. These cirrhi correspond to the sinuosities in the margin of the shell. The surface of the foot, above the muscular portion, is coated with a soft, springy integument, of perhaps one-thirtieth of an inch in thickness, which must aid the animal greatly in adhesion, by filling up all the little crevices and excluding the air." [J. P. C.]

Abundant everywhere in Orange Harbour.

Figure 444, the under side of the animal; 444 *a*, the head of the animal.

PATELLA FERRUGINEA (WOOD), Index, f. 69.

Under this name I would place a shell found common at Orange Harbour, in company with *P. deaurata*, and which, indeed, from the shell alone, might be ranked as one of the forms of that variable species. But Mr. Couthouy says, "There are also many varieties of this shell as to configuration, costæ, &c., but in no case does the animal approach that of *P. deaurata*. The foot is more elongated or oval, and lighter coloured. The branchiæ surround the whole body; the cirrhi on the mantle are longer and more slender, and the head and tentacles rather shorter. The latter have also a dark purple or brown stripe on their upper side. The colour of the entire animal is olive-green, except the sides of the foot and muscle of attachment, which are shining white. Soup was often made of this and *P. deaurata*, which was much relished."

The shell above referred to is probably the oval, elongated shell, with an anterior apex; the exterior is marked by flammules, but not the interior, except by transmitted light; the spatula at the fundus is dark gilded-brown. It might be taken for *P. flammea*, Gmelin, a shell which I suppose to be a New Zealand species, of a more depressed form, thinner, the ribs less numerous and less developed; the apex more obtuse and more central, the lines of profile much arcuated; the aperture more ovate; the interior spoon-shaped, without any depression answering to the apex; the central spatula leaden-coloured, and the surface coloured by dark, reticulating radiations. These are characters which best agree with Deshayes' amplified description, as well as with his habitat; still it may be a question which is the real *P. flammea*.

Figure 443, the animal, from below; 443 *a*, the head.

PATELLA TRAMOSERICA (CHEMNITZ), Conch., xi. 179, pl. 197, f. 1912-13. LAMARCK; Anim. sans Vert., vii. 542.

Inhabits New Zealand. The localities hitherto given, Peru and Chili, are probably erroneous.

PATELLA FIMBRIATA (*Gould*).

Testa elevata, obliquè conica, fusco-purpurea, cinereo tincta, costulis distantibus rotundatis radiata, costulis tuberculos fornicatos in seriebus concentricis instructos gerentibus; apice acuto subcentrali: apertura ovata; limbo lato, nigro pectinato: facies interna nitida, cæruleo-alba, secundum costulos radiata, fundo saturatiori.

Patella fimbriata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 149. July 1846. Expedition Shells, 7.

SHELL elongated-oval, conical, apex acute, nearly central; colour dusky, with a tint of olive, purplish near the margin; surface with about twenty-two small, radiating, pretty regularly disposed, rounded ribs, on which are arranged distant, dark-coloured, horizontally compressed, sometimes even vaulted nodules, disposed in concentric ranges. Interior channeled to correspond with the ribs, bluish porcelain-white, with a pitchy blotch at centre; marginal limb wide, scalloped, the raised portions black, and the depressed spaces bluish. Muscular impression scarcely perceptible; when held to the light it appears tessellated about the apex, and radiated with light colour between the ribs towards the margin.

Length an inch and one-fifth; breadth nearly an inch; height nearly half an inch.

Inhabits the Straits of De Fuca, Oregon. *Lieutenant Case*.

A specimen having the same shape, number of ribs, and interior, has the nodules less conspicuous and flattened, the ground-colour deep olive, flecked irregularly with whitish.

It is much like *P. granularis*, in shape. The undulations within, corresponding to the ribs, are marked with unusual distinctness. Its ribbed surface and destitution of striæ distinguish it from all the varieties of *P. pintadina*.

Figures 445, 445 *a*, outer and inner views of the shell; 445 *b*, profile view.

PATELLA CINNAMOMEA (*Gould*).

Testa parva, ovalis, convexa, tenuis, cinnamomea, cum striis radiantibus, tenuibus, confertissimis, imbricato-asperis; apice acuto, antico, ad marginem valdè declinato; aperturæ margine anteriori excurvato, intus costâ albâ marginali munito.

Patella cinnamomea, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 151. July 1846. Expedition Shells, 9.

SHELL small, thin, oval, convexly arched, of an intense cinnamon-colour within and without. The apex is acute, projecting even beyond the anterior margin and nearly touching it, so that the apex is far below the most elevated point of the shell, which is nearly central. Surface covered with minute, very numerous, radiating striæ, which are rough with crowded points, that are very slightly vaulted. The aperture is an elongated oval, the margin minutely crenulated, and at the anterior portion broadly excurved and strengthened within by a white, marginal rib, causing the interior to resemble a *Navicella*.

Length half an inch; breadth three-eighths of an inch; height nine-fortieths of an inch.

Obtained at New South Wales, from Mrs. Mitchell.

Closely allied to *P. Galathea*, Lam., which is, however, snow-white, more circular, the apex more central, and but slightly deflected, and the striæ are much coarser.

Figures 447, 447 *a*, views of the outside and inside of the shell; 447 *b*, details of sculpture, magnified.

PATELLA ARGENTATA (GRAY), Appendix to Beechey's Voyage, 148, tab. 39, f. 7.

ANIMAL with the foot oblong, rounded at the angles, olivaceous, edged with yellow; head rounded, yellow; branchiæ conspicuous, greenish-yellow; mantle undulated, yellow, with a tint of green, the

edge bearing a series of very conspicuous cirrhi, alternately longer and shorter, of yellow colour, annulate with olive.

Inhabits Valparaiso.

Figure 451, the animal, from below.

PATELLA INSTABILIS (Gould).

Testa olivaceo-cervina, elongata, elevata, ad latera compressa, creberrimè radiatim striata, apice subcentrali, obtuso, castaneo: apertura oblongo-elliptica; margine integro: facies interna lactea.

Patella instabilis, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 150. July 1846. Expedition Shells, 9.

SHELL rather solid, elevated, the apex nearly central, compressed at the sides, so as to be made nearly semicylindrical, or like a gipsy's bonnet, convex at base, so that while the shell rests at the middle upon the sides, the ends are considerably elevated. Surface shining, slightly furrowed by numerous, nearly regular, radiating striæ; fawn coloured, with a tint of olive, lighter at the striæ. Aperture elongated-oval, the sides nearly parallel, and the ends equally rounded; margin entire; interior a dead, bluish-white, the fundus chalky-white.

Length an inch and a half; breadth nine-tenths of an inch; height four-fifths of an inch.

Inhabits Oregon, Puget Sound; Classet.

Resembles *P. compressa*, but is much more solid and smooth, darker coloured, and with the apex more nearly central. It is quite probable that the specimen examined may have derived its peculiar form from having grown attached to some cylindrical body.

Figure 454, exterior view of the shell; 454 *a*, profile of the shell.

PATELLA CONICA (Gould).

Testa parva, conoidea, elevata, valdè regularis, inornata, vel lineolis obsoletis radiantibus et concentricis striata; colore luteo-cinereo: apertura rotundata, margine simplici, limbo marginali planato.

Patella conica, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 151. July 1846. Expedition Shells, 9.

SHELL small, rather solid, regularly conical, the apex nearly central, and the aperture nearly circular; surface regular and smooth, or but faintly striated with minute, radiating, and concentric lines. Colour a dirty-drab, or yellowish ash-colour; interior cinereous; edge simple, with a regular marginal limbus of a darker colour, its internal edge defined by a furrow.

Length eleven-twentieths of an inch; breadth half an inch; height three-eighths of an inch.

Inhabits Puget Sound, Oregon.

That this is but a variety of *P. scurra*, Lesson, or *Acmea mitra*, Eschscholtz, a large series of specimens might show. But it seems to be more elevated, less symmetrical, and more delicate in its structure and markings, especially in the radiating striæ.

Figure 458, view of the interior of the shell; 458 *a*, profile view.

PATELLA (LOTTIA ?) ARANEOSA (Gould).

Testa parva, tenuis, depresso-conica, sub-equilateralis, lævis, pallidè virescens, ramulis rubiginosis araneosis reticulata: facies interna albida; margine simplici, acuto; limbo marginali planulato, rubiginoso, radioso.

Patella (Lottia ?) *araneosa*, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 152. July 1846. Expedition Shells, 10.

SHELL small, thin, rounded, slightly elevated, smooth, and without ribs or sculpture; apex nearly central, obtuse. Colour pale yellowish-green, reticulated with very fine rusty-brown lines, branching off like rootlets towards the margin. The interior is whitish, with a rusty ring just within the muscular impression; the edge is sharp and simple, and has a well-defined limbus, so thin as distinctly to repeat the external linear markings.

Length five-eighths of an inch; breadth half an inch; height one-fourth of an inch.

Inhabits the Sooloo Sea.

A pretty little shell, most probably a Lotti, resembling some of the species figured by Quoy, especially his *orbicularis*. Indeed it is so like the reticulated variety figured in pl. 71, fig. 33, that the examination of a more extensive series might show them to be identical.

Figures 450, 450 *a*, 450 *b*, outer, inner, and profile views of the shell.

PATELLA (LOTTIA?) SCABRA (*Gould*).

Testa parva, scabra, per-inequilateralis, obliquè arcuato-conica, pallidè virens, nigro diversemodè virgata, costis radiantibus scabrosis ad quindecim ornata; basi ovatâ: facies interna albida; fundo piceo, limbo marginali viridulo et piceo fimbriato.

Patella (Lottia?) scabra, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 152. July 1846. Expedition Shells, 10.

SHELL small, rude, the apex near the anterior extremity, rather blunt, moderately elevated, and the outline convex, so that the shell is more or less dome-shaped. The surface is traversed with about fifteen radiating ribs, which are usually irregular in direction, and rough. Sometimes there are smaller intervening ribs posteriorly, where the ribs are much more developed. Colour greenish, irregularly dashed with black, usually between and in the direction of the ribs, sometimes inosculating so as to form zigzag markings, and occasionally, some of the dark spots are dotted with lace-work as in *L. textilis*. Aperture regularly ovate, the edge somewhat scalloped by the ribs; interior bluish-white, with a pitch-coloured spot at the centre, and with the margin edged with greenish and black tessellations.

Length seven-eighths of an inch; breadth five-eighths of an inch; height three-eighths of an inch.

Inhabits the Bay of San Francisco, California.

About the same size, and may be only a variety, of *P. textilis*. Its arched form, rough surface, coarse black stripes, and different locality, seem to warrant its separation.

Figures 456, 456 *a*, 456 *b*, outer, inner, and profile views of the shell.

PATELLA (LOTTIA?) TEXTILIS (*Gould*).

Testa depressa, obliquè conica; apice anteriori, acuto; costis latis, elevatis, subplanulatis, nodosis ad quindecim radiantibus; epidermide viridi, punctis albidis quadratis reticulato: basi ovato-rotundato, limbo marginali albido et fusco-viridi fimbriato: facies interior albida. fundo piceo.

Patella (Lottia?) *textilis*, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 152. July 1846. Expedition Shells, 10.

SHELL small, depressed, rather thin, apex at the anterior third, pointed; form obliquely low conical, with about fifteen broad, flattened, well-elevated ribs, rendered somewhat nodose by the irregular stages of growth. Surface covered with a dark emerald-green epidermis, which is dotted with numerous square white spots, so as to resemble lace-work. Interior bluish-white, with a chestnut central cloud, and with the edge broadly margined with checks of light and dusky green. and slightly modified by the ribs.

Length one inch; breadth three-fourths of an inch; height three-tenths of an inch.

Found at the Straits of De Fuca, and Killimook, by *C. Pickering* and *J. Drayton*.

Like some varieties of *P. viridula*; but its base is less orbicular, its colour is darker green, and the reticulations are finer and less in zigzag; the ribs are less numerous, nodular, and not paler. Its remote locality favours the idea of its being distinct.

Figures 457, 457 *a*, 457 *b*, outer, inner, and profile views of the shell.

LOTTIA CYMBIOLA (*Gould*).

Testa solida, depresso-conica, arcuata (apice eccentricâ) glauco et fusco-olivaceo radiata, radiatim creberrimè puncto-striata: apertura elliptica; labio minutissimè crenulato: facies interna, albida, spadiceo sordidata; limbo lato, fusco et albo tessellato.

Lottia cymbiola, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 151. July 1846. Expedition Shells, 10.

“The ANIMAL of this beautiful little species has the foot and mantle of a delicate flesh-colour, passing into brownish on the edge of the latter, which is fringed as usual, and is furnished near its edge by a series of vesicular protuberances; neck unusually long and slender, and, with the head, is delicate lake red; tentacles long and slender; eyes inconspicuous; branchial plume very small, and never protruded externally. It was invariably found attached to other shells, especially to *L. zebrina*, in which it excavated a cavity of sometimes an eighth of an inch deep. Its movements are therefore probably very slight. Two of them which were kept for examination, left their holes and removed about an inch, but returned again after a short time. They would remain in a jar attached to the same spot for twenty-four hours together, merely moving the head a little.” [J. P. C.]

SHELL small, rather solid, depressed conical, or dome-shaped, arched at base, so as to rest on its two extremities; surface regularly and minutely striate, the striæ minutely punctured; colour bluish-white, radiated with about twelve rather broad but unequal pencils of dusky olive, which occupy nearly as much surface as the lighter intervals; apex eccentric, obtusely rounded; aperture oval, its margin delicately crenulated; interior bluish-white, with a central dusky spatula, or with only here and there blotches of a rusty colour, especially about the margin of the muscular impression, which is well developed; marginal border broad, irregularly chequered with black, or green and white.

Length nine-tenths of an inch; breadth seven-tenths of an inch; height three-tenths of an inch.

Inhabits the Bay of Valparaiso.

A small, rather smooth shell, arched in every direction. The coloured margin is sometimes wanting. When fresh, it is very prettily radiated, but the exterior rays are seldom seen except near the edge, as the surface is usually much defaced by erosion or by coralline incrustations. Sometimes the fascicles of rays are formed of delicate green lines.

Figures 453, 453 *a*, exterior and interior views of the shell; 453 *b*, profile of the shell; 453 *c*, foot of the animal.

LOTTIA PINTADINA (*Gould*).

Testa diversissimè figurata et picta, tenuis, ovato-rotundata, radiatim et confertim striata, smaragdina, interdum fuscescens vel cinerascens, maculis crebris albidis tessellata aut radiata; apice plerumque sub-centrali, plus minusve elevato: facies interna cæruleo-albida, nitens; fundo piceo; limbo lato, piceo et albido tessellato.

Lottia pintadina, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 151. July 1846. Expedition Shells, 9.

SHELL thin, homologous, very various in form and colouring. It is rounded oval, the length not much exceeding the breadth, the apex usually subcentral, generally depressed. Surface delicately radiated with numerous, fine, elevated striæ; colour a deep emerald-green, which varies towards ash-colour, and spotted somewhat in quincunx, with small, yellowish-white, oblong spots, which freely transmit light. Interior glistening bluish-white, usually with a pitchy black, imperfect, central spatula, and with a broad margin of the same colour, generally tessellated with whitish spots.

This very variable species is the analogue of *L. testudinalis*, and may be distributed under three principal varieties, viz.:

a. SHELL depressed, apex nearly central; surface beautifully tessel-

lated with about equal proportions of green and whitish ; interior marginal limb broad and tessellated, the dark predominating.

The length, width, and height of two specimens were as follows, in tenths of inches : 16, $13\frac{1}{2}$, 4, and 14, 11, 5.

Collected at Straits of De Fuca, and mouth of Columbia River.

β . SHELL similar in form, but the colours cinereous and arranged rather in radiating stripes, occasionally bifurcating ; internal marginal limb narrower, the light predominating over the dark.

Dimensions, 18, 15, 5, and 10, 9, 5.

Found at Columbia River ; Puget Sound ; Straits of De Fuca.

γ . SHELL more solid, more elevated, the vertex more anterior, the colour very dusky, some specimens scarcely exhibiting light spots, though a few are generally found anteriorly. Internal marginal limb black or broken with occasional lines of whitish.

Dimensions, 11, 9, 3, and 15, 13, 9.

Found at Straits of De Fuca ; Killimook ; San Francisco.

Two shells in the Cabinet of the Boston Soc. Nat. History, are much thinner and depressed, strongly striated, and have a chestnut ground-colour, when held up to the light, and the whitish spots are arranged in fine, broken, radiating lines.

It would seem strange that a shell so conspicuous and so abundant should have escaped description, but I can find none answering to it, unless it be *Acmaea patina*, Eschscholtz, the same as his *A. scutum*, in his Zoological Atlas, which agrees well with our second group.

Figures 455, 455 *a*, outer and inner views of the shell ; 455 *b*, 455 *c*, profile views of two varieties.

LOTTIA ZEBRINA (LESSON), in Voy. Amer. Merid., pl. 65, f. 1-3. *L. variabilis*, GRAY ; Append. to Beechey's Voyage.

ANIMAL. Foot clear ochre, very large and thick ; head lighter coloured ; mouth very large, and surrounded by a sort of veil-like prolongation, which is occasionally spread out, like a broad, circular disk. Tentacles short and stout, under side same colour as head, upper side darker ; plumule very long and large compared with other species

found here, yet seldom protruded. Mantle dull yellow, with a tinge of green, and bordered by a narrow line of the latter colour, fringed with short cirrhi; about one-third of the distance from the edge to the junction with the foot is an encircling series of slight protuberances, which appear to communicate with the cirrhi, and at first look like branchial lamellæ; at times these are very apparent, and again are scarcely visible. This structure brings it into approximation with the true *Patella*. [J. P. C.] Indeed it is figured as such by D'Orbigny, who says of the animal, "de forme ordinaire, ayant, entre le manteau et le pied, les lobes branchiaux très marqués; ce qui précède montre que d'après l'animal, cette espèce appartient aux véritables Patelles, et non au genre *Lottia* ou M. Gray l'a placé." M. D'Orbigny was doubtless misled by the peculiar tubercles noticed by Mr. Couthouy, and his attention was thus withdrawn from the true branchial plume, which is really so largely developed. The range of tubercles in this species is highly decisive as a mark to distinguish it from the next species, without which it might be difficult to pronounce them distinct. Mr. Gray, indeed, has included them both under his *L. variabilis*. As two names, however, will be requisite, the name long since given by Lamarck to the following species, and that given by Lesson to this, are to be preferred to the equivocal one of Mr. Gray.

Found in exposed situations at Vigna del Mar, Bay of Valparaíso.

Figure 460, outside view of the shell; 460 *a*, the animal from beneath.

LOTTIA VIRIDULA (*Patella viridula*), LAMARCK; Anim. sans Vert., vii. 539. DELESSERT; Recueil, &c., pl. 23, f. 2.

ANIMAL. Foot clear ochreous yellow, inclining to orange, the mantle of a lighter shade, and ornamented on its margin at intervals with numerous short, pale-yellow cirrhi. Head prolonged into a sort of trunk, and remarkable for the great thickness of its neck at its origin, which gives it a subtriangular form. Tentacles short, of a paler colour than the head, which is a lighter shade of the same hue as the foot. Eyes small and indistinct, situated near the posterior

base of the tentacles; branchial plumule short, broad, pyramidal, just visible at the right side of the neck. Habits sluggish.

Common on rocks exposed to the surf, Valparaiso. [J. P. C.]

Figure 459, profile view of the typical shell; 459 *a*, the animal, from beneath.

A small, elevated form, obtained at Orange Harbour, would seem to be identical with this species. We often find specimens where the central portion representing the early stages of the shell have this elevated, conical form, and then the marginal portion suddenly takes a new direction, and finishes off with the usual form, the whole looking like a hat with a conical crown and broad brim. Mr. Gray has given this as one of the forms of his *L. variabilis*. Mr. Nuttall also brought home many specimens, which he distributed under the name of *P. monticula*. The animal, as observed by Mr. Couthouy, gives some ground for holding it as a distinct species. His description of the animal and shell is as follows.

ANIMAL. Foot very broadly rounded, varying in colour from orange or clear ochreous to nearly white. Head darker coloured, lips rosy flesh-colour; tentacles very long and slender, with the eyes large and distinct, at their external base; mantle coloured like the foot, at margin, but its inner portion has a bright green tinge; marginal cirrhi very numerous and fine, tinged with purple at base, yellowish-white elsewhere. Branchial plumule very long, its lamellæ opposite and full of fine, transverse striæ, and not extending quite to the base of the plumule, which is attached by a small, naked pedicle.

SHELL small, solid, conical, sometimes depressed, but generally quite elevated; apex acute, subcentral, and in the most elevated ones nearly vertical, but in others slightly inclined forwards. There are about ten or twelve rounded, somewhat nodular ribs, situated at the sides and behind, and with only some minute, rather crowded ones in front. Lines of growth crowded, rather lax; colour dirty-olive, darkest between ribs, and dotted with whitish. Aperture rounded-ovate; within bluish-white, with the central spatula very dark, greatly varied, but commonly composed of longitudinal stripes, or annular spots, &c. Margin crenulated by the ribs, the spaces answering to the ribs

greenish-white, and the intervals black, which last spots are often divided by several white lines.

Figure 459 *d*, profile of the shell and animal; 459 *e*, the animal, from beneath.

There are no two shells more difficult to separate from each other than *L. viridula* and *L. zebrina*. They both inhabit the same localities, and individuals might be selected so widely differing in form and colouring as to constitute at least ten species, and it is only by observing a large series that their alliance would be allowed. The elevation, greater or less irregularity of surface, and the colouring of the spatula at the fundus, are not to be relied on. The arrangement of the external colours is the most certain diagnostic. In one, when held up to the light, the markings are small, triangular, resembling a fine network, arranged more densely in the interstices between the ribs. Among them are some exactly resembling the figure of Lamarck's *P. viridula*, in Delessert's Recueil; and among those we have all varieties, from the elevated cone with a striped spatula, from Orange Harbour, to the flat, eroded, beautifully marbled specimens from Valparaiso. In *L. zebrina*, on the other hand, the ribs are less numerous, and the olive colour is arranged in concentric series of large crescentic or arrow-headed spots, giving the colour a coarse, zigzag aspect. These vary less in altitude, and the central spatula is generally imperfect and simple chestnut-coloured or entirely wanting.

Figure 459 *b*, flat, eroded variety, with a tortoise-shell spatula; 459 *c*, elevated variety, with striped spatula; 459 *f*, branchial plume.

LOTTIA ONYCHINA (*Gould*).

Testa deformis, tenuis, depressa, rotundato-ovata, costis obsoletis radiantibus ad viginti, et gradibus incrementi confertis laxis notata; apice subcentrali eroso: extus cinerea, interspatiis costarum plerumque fusco-olivaceis; intus lutea castaneo variegata; margine acuto, irregulari.

SHELL small, thin, irregular, depressed, broadly ovate, with twenty or more obsolete, unequal ribs. The general colour is ashy green, with deep olive stripes between the ribs. Besides this, the whole

surface is marked with fine radiating striæ, and by crowded loose lines of growth, giving the surface a decomposing aspect. Margin sharp, irregular; interior mottled with cream-colour, and clear chestnut-brown; central spatula thick, and well marked; a marginal border is striped alternately chestnut and yellow, answering to the ribs and intervening spaces. Summit eroded, dark brown.

Length four-fifths of an inch; breadth half an inch; height one-fourth of an inch.

The specimens were marked Rio Janeiro, but they so much resemble shells from the Pacific coast, that I think there must be some mistake. They especially resemble depressed specimens of *L. scabra*.

Figures 461, 461 *a*, 461 *b*, outer, inner, and profile views of the shell.

LOTTIA SCUTUM (ESCHSCHOLTZ), as figured by D'ORBIGNY; Amer. Merid., pl. 64, f. 8, 9. Varieties have also received from Eschscholtz the names of *Acmaea persona*, *A. radiata*, and *A. ancylus*.

The ANIMAL has the foot a light ochreous colour, lower part of head the same, upper part, back of head and tentacles having a laky tinge; tentacles long and slender, with the eyes at their base hardly apparent, nearly on back part. Mantle lighter coloured than the foot, sometimes faintly tinged with green, full of numerous transparent veins and fringed with close-set, short, marginal cirrhi (almost as fine as hairs). Branchial plumule elongated and slender, just apparent externally on right side of the neck. Motions active. [J. P. C.]

Found in exposed situations near Vigna del Mar, Bay of Valparaíso.

LOTTIA SCURRA? (LESSON).

ANIMAL almost colourless, except the head, which has a roseate tint. Head very large, and the mouth furnished with a sort of fringed lip, formed by a prolongation of the muzzle; tentacles very large and

slender, faintly roseate, and having the eyes at their lateral and posterior base, almost imperceptible; mantle colourless, finely fringed by very short, marginal cirrhi, and having around its whole extent, near the edge, a series of thin, large, obtusely triangular lamellæ, very closely resembling branchiæ. The branchial organ, however, is very large, and conspicuous externally on the right side of the neck. The marginal lamellæ seem to unite this animal with *Patella*; but no striæ, such as usually characterize branchiæ, were perceptible upon them. As in *L. zebrina*, they seemed to communicate with the marginal cirrhi, and were at times quite turgid, while at others they were flaccid and compressed. They were placed at right angles with the margin, and about their width apart from each other. They were not contractile, but capable of being erected and lowered at pleasure.

[J. P. C.]

Found imbedded in the stalks of Fuci, in the Bay of Valparaiso. Very sluggish.

The animal of this shell, which is the *Patella scurra* of Lesson, or an allied species, is worthy of notice on account of its approach to the true *Patella*. This has been noticed by Lesson and D'Orbigny, and also by Mr. J. E. Gray, in his Synopsis, when speaking of the genus *Scurra* of Eschscholtz. The observations of Mr. Couthouy on this animal, and upon that of *L. zebrina*, throw light on the equivocal position of the groups. The genus *Scurra* may stand, based on this character of the animal.

SIPHONARIA CORNUTA (*Gould*).

Testa rudis, fuliginosa, valdè depressa, per-inequilateralis, radiatim striata, apice submediano, costis ad quindecim inequalibus, ultra marginem prolongatis, præcipuè costâ supra-siphonali: cavitas parva, minimè profunda, dextrorsum effusa; limbo marginali expanso, albo, vel fusco inter costas radiato.

Siphonaria cornuta, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 153. August 1846. Expedition Shells, 11.

SHELL solid, very irregular and rugged, nearly flat, the apex median, but with the siphonal side broadly expanded; colour dusky,

mixed with white; surface with about fifteen, unequal, somewhat curved, triangular ribs, with fine, intervening striæ. Aperture ovate, edge very irregularly and profoundly dentate by the prolongation of the ribs, especially those over the siphonal canal. Cavity small and shallow, the left margin rendered abrupt by a very thick callus over the muscular impression, either yellowish or mottled with brown; muscular cicatrix very strongly marked; siphonal canal deep, very oblique; marginal limb broad, flattened, white or pencilled with brown.

Length one inch; breadth four-fifths of an inch; height one-fifth of an inch.

Inhabits the Sooloo Sea, Mangsi. *C. Pickering*.

This flattened, unsymmetrical shell, has a very small, shallow cavity, limited to the muscular impression and included space, which at one side is straight, abrupt, and excavated, while on the siphonal side it is rounded, gently sloping, and effuse, so that the shell looks much like the valve of an oyster. The rest of the under surface presents a broad, flattened margin. It is allied to *S. atra*, to which it may possibly be traced by its varieties; but it is more elongated, less symmetrical, and the ribs, which are much more numerous on the left than on the right side, surpass the margin to a much greater extent.

Figures 467, 467 *a*, 467 *b*, outer, inner, and profile views of the shell.

SIPHONARIA INCULTA (*Gould*).

Testa parva, crassa, irregularis, depresso-conica, costulis viginti ad viginti-quatuor radiata; apice sub-centrali: cavositas profunda, latere sinistro præcipiti, latere dextro declivi; fundo fusco-nubeculato; cicatrice musculari profundâ; limbo marginali expanso, sericeo, hepatico; margine costulis dentato.

Siphonaria inculta, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 153. August 1846. Expedition Shells, 11.

ANIMAL bright yellow above, finely dotted with bronze-green near the shell; beneath, the locomotive disk and head are bright yellow, the mantle deep green, passing into yellow towards its edge. Head transverse, not emarginate in front; eyes distinct, widely separated.

SHELL small, solid, very irregular in all its outlines, very inequilateral, moderately elevated, the apex nearly median, with about twenty to twenty-four rather large, unequal ribs. Exterior eroded and covered with an ashy deposit. Aperture somewhat semicircular, the siphonal edge being rounded, and the opposite one being nearly straight. Cavity rather deep, the wall on the right side being precipitous, while on the siphonal side it is gradually sloping; fundus with a thick callus, black or mottled with brown; muscular cicatrix very strongly marked; marginal limb expanded, liver-coloured, with a silky lustre, edge denticulated and tipped with yellowish.

Length seven-tenths of an inch; width seven-twentieths of an inch; height one-fourth of an inch.

Inhabits New Zealand.

Differs from *S. cornuta* in being smaller, less depressed, with more numerous, smaller, and less angular ribs, and by its coloration. Its cavity is deeper, but in respect to the straight, abrupt wall of callus on the one side and gentle slope on the other, it is similar. It may be known by its rude aspect, and its liver-brown interior margin.

Figure 465, exterior of the shell; 465 *a*, profile view of the shell, and animal; 465 *b*, locomotive disk of the animal.

SIPHONARIA NORMALIS (*Gould*).

Testa parva, tenuis, symmetrica, basi rotundata, elevato-conica, fusco-cinerea, creberrimè costato-striata, striis subequalibus: subtus fundo castaneo, limbo marginali mustelino; cicatrice benè impressâ; labio acuto, ad canalem siphonalem angulato, albido lineolato.

Siphonaria normalis, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 154. August 1846. Expedition Shells, 12.

SHELL small and delicate, nearly circular at base, but a little angular where the siphon issues. The shell is quite regularly conical, elevated, the apex entire, acute, recurved; smoky ash-colour; surface covered with numerous, crowded rib-striæ, of which about every fourth one is larger; the lines of growth are very delicate, rather irregular, and merely give the surface a dead ground. Muscular scar narrow, but well impressed, within which the colour is chestnut, and outside of it mouse-coloured, lineated with paler to correspond with the ribs; edge sharp and very delicately crenulated.

Length two-fifths of an inch; breadth seven-twentieths; height three-twentieths.

Inhabits the Sandwich Islands.

A small, delicate species, very different from any I have seen. Its circular base and regular conical form, with its very numerous and nearly equal rib-striæ, and its peculiar pale chocolate-colour distinguish it.

Figures 468, 468 *a*, 468 *b*, three views of the shell.

SIPHONARIA LEPIDA (*Gould*).

Testa parva, tenuis, ovato-rotundata, depresso-conica, cinereo-olivacea interdum violaceo tincta; apice submediano, obtuso; costis radiantibus numerosis depressis, quorum ad duodecim majoribus, albicantibus; striis incrementi confertis, laxis: intus livida, albido radiatim lineata; margine vix crenulato, pallescente.

Siphonaria lepida, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 154. August 1846. Expedition Shells, 11.

ANIMAL pale blue, thickly dotted with black, above; locomotive disk oval, deep olive-green; mantle pale, nearly colourless; head small, transverse.

SHELL small, thin, rounded-ovate at base, with a salient siphonal angle, of a low pyramidal form, the summit obtuse, and nearly cen-

tral. The surface is marked with slightly elevated, rounded, radiating ribs, of which some twelve are more developed than the intervening ones, and of a paler colour. The lines of increment are crowded, and rather loosely adhering, giving the surface a slightly scaly appearance; the general colour is pale ashy-green, with tints of violet, especially between the ribs and on old specimens. The interior is pale livid, with whitish radiations corresponding to the ribs; the margin is paler, sharp, somewhat lobed (in young specimens) by the projection of the larger ribs. Muscular impression faint.

Length nine-twentieths of an inch; width seven-twentieths; height three-twentieths of an inch.

Inhabits Rio Janeiro.

Allied to *S. plicata*, Quoy: which, however, is described as solid; its summit inclined backwards; its ribs equal; its interior pale horn-colour, radiated with pairs of reddish lines; and it is also an inhabitant of a very distant locality,—the Tonga Islands.

Figure 466, the exterior of the shell; 466 *a*, profile of the shell and animal; 466 *b*, the animal, from below; 466 *c*, interior of the shell.

SIPHONARIA LESSONI (BLAINVILLE), Malacol., pl. 44, f. 2. D'ORBIGNY; Amer. Merid., p. 56, f. 12–14. LAMARCK; Anim. sans Vert., vii. 562.

ANIMAL deep purplish or bluish black, finely speckled with white dots, and with a faint, ochreous margin to the foot. Cephalic mass very broad and deep, slightly notched in front; eyes apparent, approximate, at its median anterior portion; underneath pale ochreous, as is the foot, with a slaty hue in addition. In some individuals the foot is altogether a pale slate-colour. Siphonal duplication adherent at its anterior portion to the margin of the mantle, and extending nearly parallel with it as far as the respiratory cavity, whence it is prolonged outwardly in the form of an oblong flap, whose margins are undulate or plicate, and its posterior end free. Mantle pale slate-colour, its margins ornamented with short, black lineations, corresponding to the crenulations on the margin of the shell. In young

specimens, the animal is quite black, the shell perfectly smooth, black and shining, with the apex always much recurved. [J. P. C.]

Figure 463, lateral view of the animal and shell; 463 *a*, foot of the animal; 463 *b*, head of the animal in detail.

D'Orbigny regards all the shells of this type found in the vicinity of Cape Horn as belonging to the same species. He says, "It inhabits all the southern region along the Atlantic shore, and for 12° along the Pacific coast. All the specimens from the Atlantic are nearly smooth, the summit elevated and very oblique; those from the Pacific, on the contrary, have quite well-marked ribs. All their other characters being the same, these differences do not seem sufficient to distinguish them specifically."

Mr. Couthouy, on the other hand, from careful examination of the shells and animals of numerous individuals, comes to a different conclusion, and makes at least three species. We give them as determined by his observations.

SIPHONARIA ANTARCTICA (*Couthouy MS.*)

Testa depresso-conica, oblongo-ovata, antrorsum angustata; apice sub-centrali, sinistrorsum inclinato; striis radiantibus ad sexaginta insculpta, interstitiis castaneis: intus hepatica, margine pallido, crenulato; angulo siphonali modico; cicatrice valdè impresso.

ANIMAL dull grayish or leaden colour, with rather sparse, prominent, pale yellow tubercles scattered over it; foot more oblong than in *S. Lessoni*, and of a clear ochreous yellow extending up some distance on its external margin. Head somewhat shorter and broader than in that species. But the principal specific distinction is in the position of the eyes, which are widely apart, about one-third the space from the lateral margin to the middle of the head, instead of the reverse. Mantle ochreous yellow, with brown marginal lineations corresponding to the indentures of the shell.

SHELL rather depressed-conical, oblong-oval, narrowed anteriorly; apex nearly median, sub-central, very slightly inclined to the left, sub-acute, usually somewhat eroded. Surface with from fifty to sixty

radiating, greenish-brown costæ, with the intervening sulci dark chestnut; towards the apex a leaden colour prevails. Within deep shining brown, inclining to opalescent, margin distinctly crenulated, whitish, with the sulci showing through of a clear brown. The striæ are roughened by the intersection of the coarse, uneven lines of growth. Siphonal margin slightly projecting; impression slight, but the muscular cicatrix is deeply impressed; on each side of the head and near the siphonal exit are three deep impressions across the muscular scar, and these are observable in all Siphonariæ, indicating some peculiar arrangement of the muscle of attachment.

Figure 464, profile view of the animal, with the shell; 464 *a*, foot of the animal; 464 *b*, detailed view of the head.

SIPHONARIA LATERALIS (*Couthouy MS.*)

Testa parva, fragilis, inequilateralis, perobliqua, oblongo-ovalis, olivacea, sursum fuscescens, costulis radiantibus ad viginti-quinque obtusis, nodosis, subequalibus: intus hepatica; cicatrice musculari inconspicuâ.

Siphonaria lateralis (COUTHOUY MS.) Proceed. Boston Soc. Nat. Hist., ii. 153. August 1846. Expedition Shells, 11.

ANIMAL much smaller compared with the shell than that of *S. Lessoni*, being easily contained within it. Body and mantle of a dark olive-green. Siphonal fold paler and unusually small. Head rather small and scarcely emarginate in front; an indistinct black line surrounds the inferior face of the cephalic mass, and a reddish ring surrounds the mouth; remainder of the head dark slate-coloured, as is also the foot, except an ochreous border on the margin above. Eyes very small. [J. P. C.]

SHELL small and thin, fragile, oblong-oval, diagonally very oblique, apex elevated, acutely prolonged and recurved, nearly posterior, and at the left side, which is nearly rectilinear and vertical, while the right side is gradually sloping and curvilinear, scarcely modified by a siphonal angle. Surface dusky brown, rather rough, and furrowed by about twenty-five slight, rounded, undulating ribs, roughened by small tu-

bercles. Interior, shining, of a reddish chestnut or liver brown colour, pale and slightly crenulated at the edge. Muscular impression faint.

Length three-fifths of an inch; breadth two-fifths; height one-fifth of an inch.

Obtained at Burnt Island, Orange Harbour.

Were it not for constant differences in the animal and shell, this might be regarded as the young of the very variable *S. Lessoni*. But the apex, upon examination, never appears to have been so oblique at any stage of growth, nor so much prolonged or acute; nor the surface so roughly ribbed. Its shape is very odd, and it looks as if the left side had been half cut away.

Figure 462, the back of the shell; 462 *a*, 462 *b*, lateral and inferior views of the animal, with the shell.

FISSURELLA OCCIDENS (*Gould*).

Testa ovata, conica, valdè elevata, radiatim multistriata, fasciis atropurpureis ad quindecim et fasciis rosaceis alternantibus radiata, apice subcentrali: apertura ovata: facies interna nivea, margine latiusculo, viridulo vel fusco tessellato: fissura rotundato-ovalis.

Fissurella occidens, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 156. August 1846. Expedition Shells, 13.

SHELL very elevated, conical, apex nearly central. Surface with fine radiating striæ, and coloured with alternate rays of dark purple and light rose-colour, about fifteen of each. Aperture ovate. Interior pure dead-white, the margin dark greenish or livid, or with dusky spots answering to the dark rays. Fissure short, rounded oval.

Length one inch and three-tenths; breadth one inch and one-tenth; height eleven-twentieths of an inch.

Inhabits Callao, Peru.

A remarkably elevated species, and conspicuous for its dark, radiate exterior. Sometimes there are also concentric bands of lighter colour. In some specimens the aperture is nearly circular, in others elongated-ovate. In shape and colour it agrees with *F. Caffra*, Chemnitz, from the Cape of Good Hope, and also with *F. afra*, Quoy, from the Cape de Verde Islands.

Figures 473, 473 *a*, 473 *b*, three views of the shell.

FISSURELLA CRUCIATA (*Gould*).

Testa parvula, tenuis, nitida, elongato-ovata, arcuatim elevata, costulis radiantibus eminentibus ad triginta cum filis confertis, ordinatis concentricis decussata; apice anteriori, fissurâ elongatâ; coloribus nigris et albis cruciatim signata: intus nitida, livido et albo picta; margine crenulato.

Fissurella cruciata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 156. August 1846.

SHELL minute, thin, shining, elongated-ovate, somewhat arched, rounded at extremities, apex elevated at the anterior third, with a key-hole perforation slightly contracted at the sides. Surface sculptured with about thirty elevated, rounded, radiating ribs, for the most part alternately larger and smaller. These are crossed by concentric series of regularly and closely arranged elevated threads, which are slightly imbricated, giving the surface a beautifully cancellated appearance. Colours black and white, arranged so that radiating patches of black correspond to the two diameters, and of white to the two diagonals, the latter not continued to the margin. Edge very finely crenulated. Interior white and shining, but blue at the parts which correspond to the black of the exterior. A thick callus fortifies the perforation.

Length two-fifths of an inch; breadth one-fourth of an inch; height one-eighth of an inch.

Inhabits the Sooloo Sea.

This very closely resembles *F. minuta*, Sowerby (Conch. Ill. f. 16),

but is nearly twice as large, more elevated, and proportionally broader; the sculpture is more in relief, especially the radiating ribs, and the blue circle around the fissural opening is wanting.

Figure 474, 474 *a*, 474 *b*, dorsal, interior, and profile views of the shell; 474 *c*, details of sculpture, enlarged.

FISSURELLA VERNA (*Gould*).

Testa solida, striata, ovalis, symmetrica, depresso-conica, cinereo-viridescens, atro-purpureo radiata, costis ad viginti vel triginta sub-elevatis, planis, interstitiis adequantibus; vertice subcentrali, purpureo: fissura parva, ovalis; margine crenato: intus alliacea, fissuræ limbo radiatim striato, purpureo marginato.

Fissurella verna, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 155. August 1846. Expedition Shells, 13.

SHELL symmetrical, solid, depressed-conical, of a greenish ash-colour, and broadly rayed with dark purple; apex nearly central, purple at tip. Surface with a thin epidermis, and with about twenty to thirty depressed, nearly equal, flattish ribs, the intervening spaces of about an equal width, and subdivided by one or two striæ. Aperture regularly oval, edge coarsely scolloped. Interior of a pale verdigris or leek-green colour. Fissure small, oval, surrounded interiorly with a finely striated callus margined with bluish.

Length an inch and two-fifths; width an inch and one-fifth; height half an inch.

Another specimen is smaller, more solid, more elevated and rounded, externally cinereous, the ribs smaller and rounded, without radiating striæ, and without purple rays, but sometimes with dots about the apex; outline arched-conical, fissure elongated. Interior very pale green, the internal callus sometimes surrounded with violet; margin crenated on a smaller scale.

Inhabits Porto Praya, Cape de Verde Islands.

Much like *F. obtusa*, Sowb., but more elongated, and with its ribs, more numerous rays and faintly scalloped margin, as well as its distant locality, it may be regarded as a different species. Some specimens are not rayed, and others are entirely dark purple.

Figures 472, 472 *a*, dorsal and interior views of the shell; 472 *b*, profile view; 472 *c*, dorsal view of the small variety.

FISSURELLA CRATITIA (*Gould*).

Testa solida, elevata, ovalis, albida, radiis fuscis ad sexdecim picta, lineis elevatis radiantibus et concentricis sub-equalibus profundè imbricato-cancellata: apice sub-centrali, intus alba; margine inequaliter crenulato: foramen apicalis sub-rotunda.

Fissurella cratitia, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 155. August 1846. Expedition Shells, 13.

SHELL solid, oblong-oval at base, the apex elevated, and somewhat anterior. Colour whitish, with about sixteen rays of dusky brown. Surface marked with small, radiating, elevated striæ, some of which might be called ribs, crossed by obtuse, concentric, somewhat imbricated lamellæ, thus forming deep cancelli. Foramen rather large, rounded oval. Interior white; margin irregularly crenulated, and often striated.

Length two inches; breadth an inch and two-fifths; height half an inch.

Inhabits Puget Sound. *C. Pickering*.

It has the general aspect of *F. maxima*, but is sculptured like *F. Græca*.

Figure 471, dorsal view of the shell; 471 *a*, profile view of the shell.

FISSURELLA PICTA (LAMARCK), Anim. sans Vert., vii. 590. SOWERBY; Conch. Ill., f. 4, 26.

ANIMAL with the head conical, prolonged almost into a proboscis, with the tentacles very stout, conical, having a large oval protuberance at their base, on the summit of which are the eyes, which are large and deep black; below the tentacles, on each of the inferior sides of the head, is a longitudinal series of coarse tubercles, extending to the junction of the head with the foot. There is no neck or constriction behind the head. Mouth at the extremity of the cephalic mass, vertical, the lips thick and rugose, forming a prominent convexity around it, and occupying the whole of the extremity. Body dark purple, with olive and blackish cloudings in large blotches, furrowed with intersecting rugæ, coarsest towards the margin of the foot, which is bordered with ochreous; head and tentacles umber, clouded purple and ochreous. Foot regularly oval, flesh-coloured, with a tinge of yellow towards the edges. Mantle coloured like the foot, the edge ornamented with a beautiful arborescent fringe, whose border is clouded orange and purple.

In crawling, the foot is extended beyond the posterior margin of the shell, while the head is rarely protruded farther than the base of the tentacles, and only the extreme of the fringe is visible surrounding the shell. [J. P. C.]

Inhabits Orange Harbour.

Figure 469, the animal, as in motion; 469 *a*, the locomotive disk.

RIMULA CUCULLATA (*Gould*).

Testa solida, cinerea, per-inequilateralis, costis ad quadriginta acutis, compressis, majoribus et minoribus alternantibus radiata, et striis concentricis confertis muricata; apice elevato, acuto, adunco, prorsum spectante: fissura lanceolata: apertura ovata; margine sulcis inequalibus alternantibus crenulato: facies interna porcellana; fornice tenui, simplici, arcuato.

Rimula cucullata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 159. August 1846. Expedition Shells, 14.

SHELL rather solid, ovate at the base, and rising to form an elevated,

oblique cone, having the apex at the posterior fourth of the shell, so that the anterior slope is moderate, while the posterior slope is nearly vertical. The apex is prominent, acute; reaching forwards like a curved beak. The colour is dirty cinereous. The surface is radiated by sharp, prominent, compressed ribs, which are alternately larger and smaller, to the number of about forty; and these are crossed by very fine and crowded concentric lines, by which they are delicately muricated. Fissure narrow, and narrowing upwards. The interior is porcelain-white; the edge is beautifully crenulated by regular furrows, alternately longer and shorter, deeper and shallower, answering to the external ribs. The fissure is rounded, and the vault enclosing it is thin, simple, semicircular, and without callus at the summit.

Length five-eighths of an inch; breadth seven-sixteenths of an inch; height three-eighths of an inch.

Brought up on the anchor, Puget Sound, Oregon.

A very curious and large species, and its inequilateral form gives it a resemblance to *Hipponix*. It is much less elevated in proportion to its base than any other known species. The ribs are very regular, and sometimes still finer radiating lines are found in the interstices.

Figures 475, 475 *a*, 475 *b*, dorsal, interior, and profile views of the shell; 475 *c*, details of sculpture, magnified.

RIMULA GALEATA (*Gould*).

Testa solida, cinerea, elevata, globoso-conica, apice centrali, acuto, prorsum porrecto, striis filiformibus confertis radiata, et striis minoribus concentricis decussata: fissura brevis, fusiformis: apertura rotundato-ovalis; margine expanso, acuto, minutissimè crenulato; fornice costâ transversali anticè suffulto, fossam trigonalem utroque latere formante.

Rimula galeata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 159. August 1846. Expedition Shells, 14.

SHELL solid, ashy-white, erect, elevated conic, with the outline somewhat convex; the apex central, elevated, acute, and reaching forwards and upwards. Surface radiated with numerous nearly equal raised lines, which are decussated by much finer concentric striæ: fissure small. Aperture rounded-oval, the margin expanded and thinned to a sharp edge, which is minutely crenulated. The fornix is circularly arched over a short sulcus, and in front of it, near the summit, runs a transverse rib, leaving between it and the fornix, on either side, a triangular pit. The summit also appears to be filled with callus. Colour greenish-white within.

Length nine-twentieths of an inch; breadth eight-twentieths of an inch; height eight-twentieths of an inch.

Dredged at Puget Sound. *Lieutenant Case.*

Nearly as large, but differing altogether from the preceding in its shape, sculpture, and the interior rib, which props the fornix, and leaves two pits, which, with the fissure, would suggest the openings for the eyes and nose in the human skull. The little thread-like ribs are more or less alternately larger and smaller.

It is not a little singular that this small genus, comprising so few species, should be so widely distributed, being found in the temperate seas north and south of the Equator in both the Atlantic and the Pacific.

Figures 476, 476 *a*, 476 *b*, dorsal, interior, and profile views of the shell; 476 *c*, details of sculpture, magnified.

RIMULA CONICA (D'ORBIGNY), Voy. dans l'Amer. Merid., 471, pl. 78, f. 10, 11.

ANIMAL colourless, foot oblong-oval, narrow; head very large, not forming a proboscis on the under side, as in *Patella*, but exhibiting a circular orifice, in which is seen the true mouth, vertical, with a protuberant fleshy lip on each side; the tentacles originate from the lower and back part of the head, very long and slender, having the eyes very large and bright on a lateral enlargement, at the inferior third, immediately behind which, like a sort of spur, arises a second short, conical pair; these and the tentacles proper are continually in

motion. Mantle furnished with numerous short, filiform cirrhi. Branchial tubes ten on each side, obtusely conical, distant, surrounding the foot except anteriorly.

Several specimens were brought up on the cable in Scapenham Bay, Cape Horn. [J. P. C.]

The shell agrees sufficiently well with the description given by D'Orbigny, though it is not quite certain to be the same species. But the description of the animal is principally important, inasmuch as it has not as yet been accurately observed and figured. From the above description, and from that of the succeeding species, a good idea of the generic characters of the animal may be derived.

Figure 477, the animal, from beneath, magnified; 477 *a*, 477 *b*, superior and inferior views of the head, magnified; 477 *c*, the shell, in profile; 477 *d*, natural size; 477 *e*, sculpture, magnified.

RIMULA COGNATA (*Gould*).

Testa conica, alba, radiatim costulata; apice incurvato; apertura rotundato-ovalis.

ANIMAL having a general resemblance to that of *Patella*, but more elongated, and, in addition to the usual number of tentacles, has two short conical ones projecting laterally from the posterior base of the regular ones. Eyes distinct, at the lower third of the tentacles. Mantle fringed with cirrhi. Branchiæ placed between the foot and the mantle, extending around the foot, in the shape of sparse conical tubes, somewhat resembling the branchial leaflets of *Chiton*, fourteen or more on each side. Fæcal matters ejected from the vertical fissure. Tentacles constantly in motion, switching to and fro. Motions rapid. [J. P. C.]

SHELL small, conical, with the apex curved, and the surface ornamented with radiating ribs of nearly uniform size; aperture rounded oval. Colour ashy-white.

Dredged in sixteen fathoms water, Orange Harbour.

This little species is similar to the preceding, but is less elevated, and the ribs are more uniform. It is also quite like *R. Noachina*.

Figure 478, dorsal view of the shell: 478 *a*, foot of the animal; 478 *b*, profile of the shell, with the animal; 478 *c*, head and tentacles in outline, enlarged.

EMARGINULA ASPERA (Gould).

Testa parva, tenuis, depresso-conica, fuliginosa; costis elevatis quadratis plerumque duplicibus ad decem albidis, ad intervallos striis crebris decussantibus exasperatis; vertice subcentrali, acuto, recurvo: intus glauca, albido-radiata; margine denticulato: incisura angusta, profunda, intus in canalem versus apicem producta.

Emarginula aspera, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 154. August, 1846. Expedition Shells, 12.

SHELL small, thin, depressed-conical; apex subcentral, acute, recurved; surface sculptured with ten or twelve principal ribs, which are square, and extend beyond the general margin, the four anterior ones being much the largest, and double; intervening spaces finely grooved with sharp radiating striæ, all finely imbricated by very numerous distinct lines of growth, rendering the surface like a rasp. Colour smoky black. Apex and ribs white; interior bluish-green, rayed with white at the ribs. Margin finely serrate, deep green. Fissure narrow and deep, with a channel prolonged to the apex.

Length four-tenths of an inch; breadth three-tenths of an inch; height three-twentieths of an inch.

Obtained at Sydney, New South Wales.

Much like *E. rugosa*, Quoy, in size and form, but altogether different in colour, sculpture, and in the larger size of the notch.

Figures 493, 493 *a*, 493 *b*, three views of the shell; 493 *c*, details of sculpture, enlarged.

EMARGINULA OSSEA (Gould).

Testa crassa, rudis, albida, oblongo-elliptica, costis, radiantibus numerosis inequalibus acutis, et striis incrementi decussata; basi arcuato, margine crenulato; cicatrice musculari benè impressâ: incisura haud profunda, intus vix in canalem producta.

Emarginula ossea, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 155. August, 1846. Expedition Shells, 12.

SHELL solid, rugged, white, sub-quadrate, rounded at angles; apex central, obtuse; striæ of growth coarse, barred by numerous highly raised, rude, compressed ribs, of which about twelve (some double) are larger than the rest. Muscular impression very deep; margin coarsely crenulated. Fissure deep, abrupt; scarcely prolonged by a channel.

Length six-tenths of an inch; breadth nine-twentieths of an inch; height three-tenths of an inch.

Inhabits the Feejee Islands.

It is allied to *E. australis*, Quoy, but is much smaller and less deeply chequered.

Figures 492, 492 *a*, 492 *b*, dorsal, interior, and profile views of the shell; 492 *c*, details of sculpture, enlarged.

.EMARGINULA CINEREA (Gould).

Testa cinerea, E. osseo similis, sed tenuior, altior, magis dispositè et delicatè clathrata: cicatrice musculari inconspicuâ: incisura minimè profunda, in canalem interiorem valdè insignem producta.

Emarginula cinerea, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 155. August 1846. Expedition Shells, 13.

SHELL thin, whitish, a little clouded, short elliptical; apex central, erect, lines of growth distant and prominent, barred by about eighteen principal compressed ribs, having usually three smaller ones in the intervening spaces, producing a finely clathrate substance. Interior whitish, muscular impression faint; margin slightly crenulate; fissure shallow, prolonged by a conspicuous lanceolate canal.

Length five-eighths of an inch; breadth four-eighths; height three-eighths of an inch.

Inhabits the Feejee Islands.

Similar to the preceding, but far less solid, and much more regularly and delicately cross-barred; and if the size of the notch, the development of its canal, and the depth of the muscular impression, are important characters, these are certainly distinct species.

Figures 494, 494 *a*, 494 *b*, three views of the shell; 494 *c*, details of sculpture, enlarged.

EMARGINULA FUNGINA (*Gould*).

Testa parva, solidula, elliptica, cinereo-virens; costis radiantibus, parvulis, quarta quaque majori, rotundatis; apice mediano, erecto: intus viridula, cicatrice musculari intrinsecus atri-limbata; margine smaragdino, eleganter crenulato: incisura lata, modicè profunda, intus in canalem ad verticem producta.

Emarginula fungina, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 154. August, 1846. Expedition Shells, 12.

SHELL regularly oval, rather solid, of an ashy-green colour; apex central, erect; surface ornamented with small, rounded ribs, about twelve of which are larger than the rest, having usually three smaller ones in the intervening spaces. Interior greenish, the muscular impression having its inner margin edged with pitchy-black. Margin regularly and deeply crenulated, and deeper green. Notch broad and deep, having a short, shallow channel within, terminating at the muscular impression.

Length half an inch ; breadth three-eighths of an inch ; height one-fifth of an inch.

Inhabits Upolu, Samoa Islands.

A very pretty species, somewhat resembling *E. parmophoidea*, Quoy, but differs in the dark colouring along the inner margin of the muscular impression, forming the figure of a mushroom, and in the greater development of the notch.

Figures 491, 491 *a*, 491 *b*, dorsal, interior, and profile views of the shell ; 491 *c*, details of sculpture, enlarged.

CREPIDULA ROSTRIFORMIS (*Gould*).

Testa solida, laevis, castanea, elevata, recurva, ad basim rotundato-ovalis ; apice postico, adunco : lamina interna angusta, alba, profundè sita, versus apicem penetrans : margine arcuatim sinuato.

Crepidula rostriformis, GOULD ; Proceed. Boston Soc. Nat. Hist., ii. 160. August 1846. Expedition Shells, 14.

SHELL solid, nearly circular at base, elevated, and curved backwards so as to resemble a short, thick beak, like that of a parrot. The apex is pointed, hooked, and projects beyond the posterior margin of the base. The surface is smooth, regular, and somewhat polished, of a pale chestnut-colour. The interior very pale chestnut, covered with a whitish bloom. The lamella is white, very short ; its anterior edge deeply and regularly curved, thin at the middle, and thickened at the sides : along its lower face a cavity penetrates into the beak.

Length three-fourths of an inch ; breadth half an inch ; height three-eighths of an inch.

Inhabits the Straits of De Fuca, Oregon.

I am acquainted with no other species where the apex is so elevated and so remote from the margin of the shell. It looks like a very ob-

tuse-angled bird's beak. The specimen examined had numerous rib-like folds on the surface, which were probably caused by its adhesion to some ribbed shell. Some specimens since received from Upper California confirm this last supposition.

Figures 482, 482 *a*, 482 *b*, outside, inside, and lateral views of the shell.

CREPIDULA LINGULATA (*Gould*).

Testa parva, depressa, obliqua, rotundata, alba, lineis numerosis crebrè divaricantibus radiata, epidermide pallido induta; apice acuto, libero, propè marginem sito: intus lutescens; septo linguiformi, excavato, ad medium carinà diviso et obliquè protruso, ad latus sinistrum profundè sinuato.

Crepidula lingulata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 160. August 1846. Expedition Shells, 15.

SHELL small, depressed, thick at the centre, but flattened and thinning towards the margin, rounded at base, the apex free, acute, slightly curving to the right, the surface near the margin furrowed with numerous, delicate, radiating lines, which branch very frequently, and covered with a very delicate, pale, fugacious epidermis. Interior pale brownish-yellow, with a broadly expanded flat margin. The septum is small, white, excavated; divided by a delicate ridge, deeply detached from the left side, and at the middle projecting far and obliquely.

Diameter half an inch; altitude three-eighths of an inch.

Inhabits Puget Sound, Oregon.

Like *S. capensis*, Quoy. The only specimen examined seems to have been convex and solid in its early growth, afterwards becoming flat. Its rounded outline and flat form might lead one to suppose it identical with *C. nummaria*, were not the septum so different.

Figures 481, 481 *a*, 481 *b*, exterior, interior, and profile views of the shell; 481 *c*, details of sculpture, enlarged.

CREPIDULA NUMMARIA (*Gould*).

Testa tenuis, explanata, circularis, alba, striis incrementalibus laxis insculpta, epidermide flavo-corneâ induta; apice vix conspicuo, marginali: septum internum latius quàm longum, deorsum fornicatum; margine flexuoso: cavositas ferè nulla.

Crepidula nummaria, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 160. August 1846. Expedition Shells, 15.

SHELL thin, white, circular, and perfectly flat, externally wrinkled by the loose stages of growth, and covered by a thick, yellowish epidermis. The apex is marginal and scarcely visible. The internal lamella is broader than long, arching, so as to enlarge the cavity which would otherwise be almost nothing. Its edge is flexuous, retreating near the middle.

Diameter three-fourths of an inch.

Obtained at Classet, Straits of De Fuca, Oregon.

This very peculiar shell is well characterized by its perfectly flat, circular form. It probably grew within some other shell, and other specimens may be found moulded into a different form. It is separated from *C. lingulata* by the form of its septum.

Figures 480, 480 *a*, 480 *b*, superior, inferior, and lateral views of the shell.

CREPIDULA COSTATA (DESHAYES), in LAMARCK, Anim. sans. Vert., vii. 644. QUOY and GAIMARD; Voy. de l'Astrol., pl. 72, f. 10-12.

ANIMAL with the foot colourless, linguiform, short; mantle greenish-yellow, shaded and edged with azure; head small, distinct, bilobate; tentacles subulate, with the eyes near the external base.

Figure 479, the animal, as seen from below.

LEPTOCONCHUS MADREPORARUM (*Sowerby*), *Gould*.

Purpura monodonta, QUOY and GAIMARD; Voy. de l'Astrol., pl. 37, f. 9-11. *Purpura madreporarum*, SOWERBY; Genera No. 42; REEVE; Conch. Icon., f. 69.

ANIMAL with its mantle lining the whole shell; ciliated at the margin, with an anterior fissure in front of the head. The foot is small, being about half the length and breadth of the shell, oval; in front of the foot are two cervical appendages, meeting broadly at the median line, and tapering to each side. Head very narrow, elongated, with a longitudinal, oval cleft below; it is apparently incapable of being advanced to the edge of the shell. Tentacles large, long, subulate; the eyes without pedicles near the terminal third. Foot deep orange-coloured; cervical appendages roseate; head and tentacles lemon-yellow. Eyes black. Mantle very densely and beautifully dotted with lilac.

It is to be regretted that no notes were to be found concerning this interesting animal, and that we are left entirely to the figure for the above characters. Indeed, it was for a long time doubtful to what shell the animal belonged, until, happily, the identical shell figured in outline with the animal, was found, and proved to be a very small and distorted specimen of the shell, well known in most cabinets under the name of *Purpura monodonta* or *madreporarum*. It is plainly not a *Purpura*, and allied to the genus *Crepidula* rather than to *Purpura*. I have ventured to place it under the genus *Leptoconchus*, which has also been grouped with the *Purpuradæ*, because the shell is very like the only species of *Leptoconchus* yet designated. At any rate, the animal is so peculiar as to justify its removal from *Purpura*, and to give it generic rank.

The shell figured was found among corals at Wake's Island, and the species is common throughout the low islands to the Samoa Islands. It is obviously often variously distorted, to accommodate itself to the fissures among the coral where it lives.

Figure 483, animal, with the shell, seen from beneath; 483 *a*, aperture of the shell, normal form; 483 *b*, 483 *c*, outlines of a variety.

CALYPTRÆA FASTIGIATA (*Gould*).

Testa parva, tenuis, lævis, rotundata, elevato-conica, concentricè et tenuissimè striata, epidermide fuscescens induta; spiræ anfractibus tribus planulatis, apice sub-mediano, acuto: lamella interna spiralis, striata; margine soluto, ad centrum duplicato, haud appresso, umbilicum parvum efformante.

Calyptrea fastigiata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 161. August 1846. Expedition Shells, 15.

SHELL small, thin, smooth, rounded at base, elevated-conical; the apex central, acute; the spire composed of three flattened whorls. Surface faintly marked by very delicate lines of growth, and covered by a thin, pale-yellow epidermis. Interior white, with a spiral lamella (septum) commencing at the vertex, and making half a revolution, terminating at the margin; its free edge folded.

Diameter half an inch; altitude five-eighths of an inch.

Inhabits Puget Sound, Oregon.

In shape, size, and interior, scarcely differing from *C. pileolus*, D'Orbigny. But that shell has a rough surface, is white, and is ribbed about the vertex. It is also like *C. squama*, Deshayes.

Figures 484, 484 *a*, 484 *b*, dorsal, basal, and lateral views of the shell.

HIPPONIX IMBRICATA (*Gould*).

Testa solida, obliquè elevato-conica, rubescens, costulis acutis radiantibus quadraginta ad quinquaginta, et lamellis concentricis concinnè imbricato-clathrata; apice submediano: apertura rotundata-ovata: intus coccinea.

Hipponix imbricata, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 161. August 1846. Expedition Shells, 16.

SHELL small, solid, of a slight fleshy tint, in the form of an elevated, slightly oblique cone. The surface is rayed with forty to fifty sharp, elevated, regularly disposed, occasionally divaricating ribs, and these are crossed by the lamellæ of growth, which are distant, regularly disposed, and as they pass over the ribs and intervening spaces, form beautifully vaulted tile-work. The aperture is rounded-ovate, the margin expanded and fringed with the terminations of the ribs, and the interior is coloured deep crimson. Muscular cicatrices well impressed.

Greatest diameter about two-fifths of an inch. Length, breadth, and height, in the proportion of 13, 11, 8.

Inhabits the Sandwich Islands.

Most like *H. pilosa* in sculpture, though the pattern is much coarser. The apex is far more central and elevated. The colour of the interior is like *H. foliacea*, Quoy, but more intense.

Figures 490, 490 *a*, 490 *b*, outer, inner, and profile views of the shell; 490 *c*, details of sculpture, enlarged.

CALYPTRÆA CHLORINA (*Gould*).

Testa irregularis, tenuis, concentricè undosa, lineis elevatis acutis confertis radiata, ad basim subcircularis, obliquè pyramidata, epidermide tenui chlorino induta; apice elevato, postico, spirali, cernuo: intus nitida, porcellana; margine evoluto, acuto; laminâ interiori semicyathiformi, brevi, reflexâ, obliquè truncatâ.

Calyptræa chlorina, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 161. August 1846. Expedition Shells, 16.

SHELL irregular, thin, waved concentrically, obliquely pyramidal, subcircular at base, marked with crowded, raised, acute, radiating lines, and covered with a thin, greenish-yellow epidermis; apex ele-

vated, spirally nodding behind the centre. Within, porcelain-white and glistening; margin acute, everted; interior lamina the vertical half of an inverted cone, short, obliquely truncated, inclining backwards.

Length half an inch; breadth three-fifths of an inch; height one-fourth of an inch.

Obtained at Porto Praya, Cape de Verde Islands.

Allied to *C. equestris*. Its depressed, orbicular, and comparatively regular form, its short cup, and its colour, are its characteristics.

Figures 487, 487 *a*, 487 *b*, back, base, and side of the shell; 487 *c*, details of sculpture, magnified; 487 *d*, the cup.

CALYPTRÆA RADIOSA (*Gould*).

Testa irregularis, tenuis, alba, lucida, ad basim rotundata, obliquè globoso-conica, lineis acutis numerosis elevatis cum striis tenuissimis intercalariis radiata; apice postico, obtuso: lamella interna elongata, semi-volutata, per-obliquè truncata; basi attenuato; cornubus lanceolatis.

C. radiosa, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 161. Aug. 1846. Expedition Shells, 15.

SHELL irregular, the vertex elevated, somewhat posterior, obtuse; base circular, and the form obliquely conical, semiglobose. It is pure white, shining, transparent; radiately marked with fine, sharp, raised lines, at a little distance from each other, and between each two of which are found from two to four (generally three) still finer lines. Interior white and shining. The interior lamella is rolled into half a cone, attached very delicately at the vertex, and its free extremity is very obliquely truncated, so as to form two lanceolate horns. Along the back it is slightly gibbous.

Diameter half an inch; altitude two-fifths of an inch.

Inhabits the Island of Mangsi, Sooloo Sea.

Differs from other similar species in having regularly disposed, rather distant raised lines, with intervening smaller ones, instead of having them all of uniform size, as in *C. equestris* and *C. lithedaphus*, to which latter it is closely allied.

Figures 488, 488 *a*, 488 *b*, exterior, interior, and lateral views of the shell; 488 *c*, details of sculpture, magnified.

PILEOPSIS CRYSTALLINA (*Gould*).

Testa parva, candida, crystallina, nitidissima, semiglobosa, ad basim ovata, sulcis profundis creberrimis radiantibus acutis insculpta; apice terminali, acuto, vix torto, submarginali: margo anticè acuminatus, posticè septiformis.

Pileopsis crystallina, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 161. August 1846. Expedition Shells, 16.

SHELL small, white, crystalline, shining, ovate at base, dome-shaped, with the apex terminal, acute, and slightly curved, projecting beyond the margin, which it closely approaches. The surface is very deeply furrowed with narrow, radiating lines, thus leaving narrow, abruptly raised ribs, which are somewhat undulated by the stages of growth. The interior is glassy, especially near the margin; which is anteriorly thinned down to a very sharp edge, and which posteriorly is flattened, and projects over the cavity, like the septum of a *Crepidula*. Muscular impression faintly marked.

Length half an inch; breadth three-eighths of an inch; height one-fourth of an inch.

The beautiful crystalline, quartz-like lustre of this shell, its deep and regular sulci, and its crepiduloid base, mark this species very distinctly.

Its locality is doubtful, but its perfection shows that it came from a coral region.

Figures 489, 489 *a*, 489 *b*, outer, inner, and lateral views of the shell.

CAPULUS SAGITTIFER (*Gould*).

Testa parva, tenuis, lucida, candida, semiglobosa, apice mediano, dextrorsum inclinato, acuto: extus lineis lacteis radiantibus, papillas sagittatas gerentibus inculpta: apertura sub-circularis; cavositas profunda; cicatricibus benè impressis et septo filiformi junctis.

SHELL small, thin, pure white, translucent, nearly semiglobose, the apex median, acute, slightly inclined to the right, not approaching the margin of the aperture; surface beautifully sculptured with fine, radiating lines, on which are series of arrow-headed beads, arranged in quincunx, and of a more opaque-white colour, giving the surface, under the microscope, a delicate, squamose appearance. Aperture nearly circular, lip simple; cavity of the beak profound, having a thread-like diaphragm between it and the margin, connecting the muscular impressions, which are distinctly marked.

Diameter one-fourth of an inch; height one-tenth of an inch.

Habitat uncertain.

This species is well distinguished by its peculiar and beautiful sculpture, the radiating lines seeming to be made up of chains of arrow-heads.

Figures 486, 486 *a*, 486 *b*, three views of the shell, enlarged; 486 *c*, details of sculpture, magnified; 486 *d*, natural size.

ORDER ACEPHALA.

PHOLAS PATULA (*Gould*).

T. oblonga, papyracea, alba, inequilateralis, concentricè undato-striata, constrictione mediano partita; latere antico triangulari, radiatim costato, costis ad undas tuberculiferis; latere postico subquadrato, infermi: margine cardinali revoluta, umbonem tegente sed non adnato, callum dentiformem instructo: cochlea subulata, arcuata: cavositate ad undas, costas et tuberculos indentatâ.

Pholas patula, GOULD; Proceed. Boston Soc. Nat. Hist., ii. 214. May 1850. Expedition Shells, 73.

SHELL transversely oblong, very thin, white, inequilateral, concentrically undate-striate, divided into two portions by a vertical constriction; anterior portion triangular, radiately ribbed, the ribs knobbed where the concentric waves cross them; posterior portion subquadrate, simple; hinge margin revolute, spreading over the beaks, but not adherent to them, and presenting a tooth-like callus; internal apophysis curved, subulate; the interior is everywhere indented in answer to the ribs, waves and tubercles.

Length three inches; breadth an inch and four-fifths; height the same.

Probably from the Eastern Seas.

This species is remarkable for the width of its valves. It nearly approaches *P. latissima*, Sowerby, and possibly may be the same species. It also resembles in form and sculpture *P. truncata*.

Figures 497, 497 *a*, 497 *b*, three views of the shell.

MYA PRÆCISA (*Gould*).

T. M. truncatæ similis, calcarea, epidermide corneo induta, ovata, anticè rotundata et ventricosa, posticè angustata, compressa et truncata; cardo dente trapezoido, latiore quam elevato, posticè declivo instruc-

tus ; lineâ palleali angustâ, crenatâ ; sinu siphonali profundo, arcuato ; cicatrice anteriori elongato, falciformi.

Mya præcisa, GOULD ; Proceed. Boston Soc. Nat. Hist., iii. 215. May 1850. Expedition Shells, 75.

SHELL transversely ovate, narrowing backwards, broadly rounded anteriorly, where it is widely open, with the lips expanded ; umbonal slope full and somewhat angular ; base nearly direct ; beaks prominent, oblique, incumbent ; epidermis cinereous, wrinkled, thin ; tooth large, its anterior edge nearly vertical, broader at base than its height, rounded posteriorly, so as on the whole to form a quadrant ; siphonal sinus broad, passing rather beyond the beak, rounded ; pallial impression narrow, crenate ; anterior cicatrix very long, falciform.

Length two and a half inches ; breadth one inch ; height an inch and three-fourths.

Inhabits Puget Sound, Oregon.

Differs from *M. truncata* in being more narrowed posteriorly, more rounded anteriorly, more inflated at the umbonal slope, in its narrow pallial impression and deeper siphonal sinus, and more particularly in having the tooth slope backwards.

Figures 498, 498 *a*, lateral and dorsal views of the shell ; 498 *b*, view of the interior.

PANOPEA GENEROSA (Gould).

Testa magna, ponderosa, calcarea, sub-quadrilateralis, concentricè unduloso-plicosa, epidermide rugoso flavido induta, anticè rotundata, posticè truncata et valdè hians ; umbonibus submedianis, acutis, elevatis, undulatis : cardo gracilis, dente elevato obliquè triangulari instructus : cavositas ad apicem profunda ; cicatrice musculari lato, benè impresso ; sinu siphonali minimè profundo.

Panopæa generosa, GOULD ; Proceed. Boston Soc. Nat. Hist., iii. 215. May 1850. Expedition Shells, 75.

SHELL large and ponderous, chalky white, of a somewhat quadrilateral form, the basal and hinge margins being nearly parallel ; the

posterior extremity broadly truncated a very little obliquely, and the anterior extremity broadly rounded; anteriorly it gapes slightly, but posteriorly it gapes broadly, and the valves are here somewhat everted. The surface is coarsely undulated concentrically, and covered by an obliquely, and somewhat plumosely wrinkled, dirty yellow epidermis. The beaks are sharp and prominent, placed near the middle of the superior margin; the anterior umbonal slope is tumid, the posterior a little compressed. The hinge is rather slender, having a single elevated, erect, obliquely triangular tooth in each valve, with a pit behind that in the right valve, and a crest-like elevation for the attachment of the ligament behind them. Ligament external and double. Cavity of the beaks profound; muscular and pallial cicatrices broad and well impressed; posterior muscular scar but little broader than the pallial impressions; siphonal sinus shallow, small.

Length six inches; height three inches; breadth four inches.

Found on mud-flats at Nisqually and Puget Sound.

This large species stands by the side of *P. Aldrovandi*, but is distinguished by the form of its anterior extremity. One specimen measures seven and a half inches in length. The animal is noted as protruding its siphon a foot in extent.

Figures 507, 507 *a*, lateral and dorsal views of the shell; 507 *b*, outline of the hinge margin.

PANOPEA ANTARCTICA (*Gould*).

T. subquadrata, crassa, alba, rudis, concentricè undata, posticè truncata, anticè angustata et rotundata; margine cardinali erecto, margine ventrali arcuato; umbonibus latis, elevatis, ferè medianis: cardo dente parvo, conico instructus: sinu palliali lato, arcuato, minimè impresso; cicatrice musculari posticâ, lunatâ.

Panopæa antarctica, GOULD; Proceed. Boston Soc. Nat. Hist. iii. 214. May 1840. Expedition Shells, 74.

SHELL solid, white, approaching to a square form, but a little longer than high, slightly curved at base, rather narrowly rounded anteriorly, and having above, broad, elevated umbones; the beaks are a little

behind the centre; the surface is very irregular, with coarse, concentric waves; cardinal tooth small and conical; ligamentary callus stout, erect; pallial sinus not deep, but broadly rounded; posterior muscular impression well marked; cavity of beaks profound.

Length two and a half inches; breadth two inches; height an inch and a half.

Obtained at the mouth of the Rio Negro, Patagonia.

Besides being destitute of ribs, it is more nearly equilateral than *P. arctica*, and has the beaks removed farther back, and is less gaping; posterior truncation scarcely oblique.

Figure 499, lateral view of the shell.

SOLENSICARIUS (*Gould*).

T. transversa, oblonga, retrorsum angustata, sub-falcata, epidermide crasso, nitido, corneo induta, anticè obliquè truncata, posticè rotundata: valvis valdè excavatis, undulatis, in areis triangularibus indistinctè partitis; margine dorsali recto; margine ventrali arcuato; natibus terminalibus: cardo dente triangulari, erecto, recurvo in utràque valvâ instructus.

Solen sicarius, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 214. May 1850. Expedition Shells, 74.

SHELL elongated, transversely oblong, subcylindrical or tubular, somewhat falcate; beaks terminal; anterior extremity truncate obliquely at an angle of about 30°, somewhat everted, the portion posterior to a line across from the beak to the base, concave; posterior extremity rounded; dorsal edge rectilinear; ventral edge regularly arcuate, so that the posterior extremity becomes about two-thirds the height of the anterior; surface notably undulated by the stages of growth, parallel to the posterior end; the dorsal and ventral triangles not definitely marked, covered by a firm, glistening, horn-coloured epidermis; valves very convex. Hinge with a single, erect, recurved, triangular tooth in each valve.

Length three and a half inches; breadth seven-twentieths of an inch; height nine-tenths of an inch.

Inhabits Townsend's Harbour, and Straits of De Fuca, Oregon.

The only species to which this bears any resemblance is *S. viridis*, which has nearly the same hinge and general form, but which is a more delicate and more slender shell, proportionally.

Figures 501, 501 *a*, lateral and dorsal views of the shell; 501 *b*, hinge, with the interior.

SOLENS SCALPRUM (*Gould*).

Testa transversa, oblonga, retrorsum dilatata, ferè unilateralis, tenuis, lucida, epidermide flavo-viridi, nitido, iridescente induta; latere antico sub-acuto, obliquè rotundato; latere postico semicirculari: cardo dentibus duobus contiguis, divergentibus in valvâ dextrâ; dente subulato, arcuato, in valvâ sinistrâ; margine cardinali costâ albâ submarginali suffulto: interior albida.

Solen scalprum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 214. May 1850. Expedition Shells, 74.

SHELL thin, fragile, translucent, glistening with iridescent reflections; epidermis pale yellowish-green; lines of growth very delicate, with vestiges of radiating striæ, transversely elongated, widening posteriorly; ventral and dorsal margins rectilinear; posterior end circularly rounded; beaks at the anterior fifth; anterior end rounded obliquely upward, meeting the dorsal margin, which slopes a little, so that the tip is above the middle; posterior umbonal slope tumid. Interior broadly gaping, bluish-white. Hinge very delicate, having two contiguous, diverging, and divaricating, narrow, compressed teeth, in the right valve; a subulate, recurved one, and the vestige of a second at its anterior base, in the left valve; anterior hinge margin strengthened by an oblique rib; posterior dorsal edge simulating a long, linear, white tooth.

Length an inch and three-quarters; breadth five-eighths of an inch; height three-tenths of an inch.

Obtained at Singapore.

A delicate and peculiar shell, allied to *S. costatus*, Say, though its

proportions are much more slender, or more like *S. radiatus*; the hinge is fortified by a thickening along the dorsal margin. There is, indeed, the vestige of a rib from the beak towards the ventral margin, as in the shells above mentioned.

Figures 502, 502 *a*, lateral and dorsal views of the shell; 502 *b*, the hinge, with the interior.

CYPRICARDIA ROSEA (*Gould*).

Testa transversa, oblonga, tenuis, anticè radiatim tenui-striata, posticè concentricè squamoso-striata: umbonibus valdè anticalibus, acutis; latere antico brevi, citò angustato, ad apicem truncato, albido; latere postico oblongo, ad apicem truncato, rosaceo; margine dorsali vix arcuato; margine ventrali recto: intus rosacea: cardo debilis, dentibus ferè longitudinalibus.

Cypricardia rosea, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 276. Expedition Shells, 84.

SHELL thin, transversely oblong, more than twice as long as high, anterior extremity short, triangular, obtusely rounded at point; beaks at the anterior sixth of the length; posterior end square, upper and lower margins nearly parallel, a little arcuate above; umbonal region smooth and shining; posterior lamellate, its anterior two-thirds radiately and thickly striate; colour dirty white, tinted rosaceous at the upper and posterior half; umbones moderately elevated, acute, touching; hinge delicate, teeth almost longitudinal; interior rosaceous.

Length an inch and three-fourths; height three-fifths of an inch; width two-fifths of an inch.

Inhabits the Feejee Islands.

Allied to *C. solenoides*, Reeve, which is much more elongated, has purplish rays, and is only tinted purple posteriorly, within. *C. coralliophaga*, Reeve, is somewhat more elongated, more laminated posteriorly, and radiate striate, and the edge only is tinted rose-red within.

Figures 535, 535 *a*, lateral and dorsal views of the shell ; 535 *b*, interior, with the hinge.

MACTRA CUNEOLA (*Gould.*)

T. parva, crassiuscula, rudis, ovato-cuneata, albida, epidermide stramineo induta, concentricè striata; umbonibus submedianis, tumidis, acutis, antevergis; latere antico angustato, subacuto; latere siphonali breviori, tumidiori, subtruncato: area cardinalis minima; foveâ ligamentali indistinctâ; dente V-formi conspicuo; dentibus lateralibus curtis, elevatis; sinu siphonali minimo, quadrantem testæ solum transseunte.

Mactra cuneola, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 216. May 1850. Expedition Shells, 75.

SHELL very small, thin, transversely ovate, wedge-shaped, nearly equilateral, white, with a thin, closely adhering straw-coloured epidermis; surface smooth and shining, with pretty regular and conspicuous concentric striæ; anterior end much the narrowest, subtriangular, subacute at tip; posterior end more tumid, with a decided angular, umbonal slope; outline somewhat rectilinear; tip broad, subtruncate; ventral edge rectilinear at the middle; anterior dorsal edge cuneate, with a large ill-defined area; posterior dorsal edge broad-ovate, moderately convex; beaks delicate, papillary, not touching. Valves convex, especially posteriorly; hinge area very delicate; ligamentary pit inconspicuous; V-tooth well-developed, prominent; lateral teeth elevated, short, triangular; siphonal sinus very small, extending scarcely one-fourth across the shell.

Length five-eighths of an inch; height half an inch; breadth three-tenths of an inch.

Inhabits Callao, Peru.

In most of its characters this little shell corresponds with our *M. lateralis*, only that in this shell it is the posterior end which is shortest and broadest, whereas the reverse is the case in that shell.

Figures 504, 504 *a*, lateral and dorsal views of the shell; 504 *b*, interior, with the hinge.

MACTRA DELUTA (Gould).

T. tumida, ovato-rotundata, hiantissima, sordida, epidermide tenui deluto, obliquè corrugato induta, concentricè undulata; umbonibus submedianis, tumidis, incumbentibus, contiguïs; margine dorsali utroque declivi; margine ventrali rotundato; lateribus obtusis: cardinis foveâ ligamentali profundâ; dente V-formi gracili, ramis inequalibus; dentibus lateralibus brevibus, trigonis, compressis; sinu siphonali propè ad centrum valvæ obducto.

Mactra deluta, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 215. May 1850. Expedition Shells, 75.

SHELL small, rather thin, tumid, rounded-ovate, nearly equilateral, dingy-white, with a thin, fugacious, obliquely wrinkled, dirty-yellow epidermis; surface irregularly and delicately undulate concentrically; beaks nearly entire, anterior end shortest, sloping rapidly, obtusely rounded; posterior end still more obtusely rounded, not truncate, widely gaping; ventral edge regularly arched; anterior dorsal edge excavated near the beaks, without a distinctly marked areola, broad, striate; posterior dorsal edge broad, rounded, excavated near the beaks; beaks tumid, acute, contiguous, the two umbonal slopes about equally tumid. Valves globosely convex; hinge area large; ligamentary pit deeply excavated; V-tooth delicate, sides unequal in length and thickness; lateral teeth short, elevated, thin, triangular; siphonal sinus rather broad, extending nearly half across the shell.

Length an inch and seven-eighths; height an inch and six-eighths; breadth an inch and one-tenth.

Inhabits New Zealand.

The external appearance is rather that of a rude Venus, and has fewer angularities than any other *Mactra*. It is also peculiar for its very wide gape.

Figures 503, 503 *a*, lateral and dorsal views of the shell; 503 *b*, interior view, with the hinge.

MACTRA MARCIDA (Gould).

T. ventricosa, ovato-triangularis, cretacea, epidermide tenui stramineo induta; umbonibus medianis, tumidis, remotis, vix antevergis; latere antico breviori, rotundato; latere siphonali subtriangulato, acuto; margine ventrali arcuato: fovea ligamentalis ampla; dente V-formi parvo, prominente; dentibus lateralibus crassis, parum elevatis: interior cretacea; sinu siphonali parvo, trientem testæ attingente.

Mactra marcida, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 216. May 1850. Expedition Shells, 76.

SHELL of medium size, solid, coarse, chalky white, covered with a very thin straw-coloured, shining epidermis; surface irregularly undulated concentrically. Form rounded ovate-triangular, nearly equilateral; anterior end obtusely rounded, narrower than the posterior, and a very little shorter; posterior end short, triangular, obtusely rounded at point, very nearly closed. Beaks prominent, tumid, the points rather remote from each other; anterior edge direct for half its length, then arching downward, very broad, rounded, without distinct areola, a faint line on each valve enclosing a large space; posterior edge broad, obtuse, regularly arched, not truncate; umbonal slope tumid; valves ventricose, rather thick, chalky white within; siphonal sinus small, traversing about one-third of the valve; cardinal area median; cartilage pit deep; tooth strong, sides equal; lateral teeth strong, elevated, triangular.

Length two and three-fourths inches; altitude two and one-fourth inches; breadth an inch and a half.

Inhabits Orange Harbour.

This species has precisely the form of *M. lactea*, but is a much more solid and rude shell, wanting also the decided dorsal angularities of the umbones.

Figures 505, 505 *a*, lateral and dorsal views of the shell; 505 *b*, interior, with the hinge.

MACTRA FALCATA (Gould).

Testa magna, transversa, ovato-trigona, inequilateralis, convexiuscula, modicè hians, albida, epidermide fulvo, nitido, concentricè rugoso induta; umbonibus acutis, approximatis; latere antico acuminato; latere siphonali latè rotundato, sub-truncato; margine dorsali recto; areâ dorsali planulatâ, lanceolatâ; margine ventrali leniter arcuato: area cardinalis ampla; fossâ ligamentali magnâ, dente V-formi parvo, crasso; dentibus lateralibus compressis, quorum antico valvæ dextræ bilobato: interior lactea; sinu siphonali angusto, elongato, spatulato.

Mactra falcata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 216. May 1850. Expedition Shells, 76.

SHELL large, solid, transversely ovate-triangular, subfalcate, inequilateral, hinder end short, moderately gaping, white, covered with a thick, shining, dusky, straw-coloured epidermis; surface delicately marked by incremental lines, with obscure distant radiating ridges; beaks acute, nearly touching, post median, rather compressed; anterior end narrower than posterior, triangular, somewhat ascendant, extremity rather acute; posterior end broadly rounded, truncate at tip, in young specimens more triangular; basal edge regularly arcuate; anterior dorsal edge rectilinear, presenting a plane lanceolate space in front of the beaks; posterior dorsal edge rounded, with a coarse, loose, dusky epidermis. Valves slightly convex; within milk-white; siphonal sinus reaching as far as the beak. Cardinal area large; ligamentary pit large, oblique, shallow; sides of V-tooth very unequal, strong; lateral teeth thin, elevated, anterior one of left valve bilobate.

Length three and three-fourths inches; height two and a half inches; breadth an inch and an eighth.

Inhabits the Northwest Coast, Puget Sound.

This fine species compares best with *M. Brasiliana*, and *M. ovalis*, but it is much more inequilateral, and much more broadly obtuse posteriorly than either of them. Its external characters correspond closely with the former, while the narrower siphonal sinus and the hinge

closely resemble the latter; the bilobed anterior lateral tooth of the right side, however, is quite peculiar. Small specimens remind one strongly of *Mesodesma arctata* and *Jauresii*.

Figures 506, 506 *a*, lateral and dorsal views of the shell; 506 *b*, interior, with the hinge.

MACTRA DEBILIS (*Gould*).

T. parva, alba, tenuis, transversa, elongato-ovata, anticè rotundata, posticè acuta, valdè hians; umbonibus antemedianis, eminentibus, acutis; valvis tumidis, posticè compressis, epidermide stramineo tenui indutis: cardo debilis; dente V-formi parvo; dentibus lateralibus curtis, acutis.

Mactra debilis, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 348. December 1850. Expedition Shells, 98.

SHELL small, white, very thin and fragile, inequilateral, widely gaping, transversely elongate-ovate, anteriorly regularly rounded, posterior extremity acutely rounded, somewhat nasute; posterior dorsal margin, very slightly arcuate; ventral curve regularly arcuate; beaks somewhat anterior, prominent, acute; valves somewhat flexuous; the disk tumid, compressed posteriorly, covered with a very thin, rugose, straw-coloured epidermis; very delicate concentric striæ. Hinge very delicate; V-tooth small; lateral teeth scarcely at all developed, very thin and short, between which, and the margin is a deep and long furrow, making almost the whole of the dorsal edge, as it were, two-edged.

Length an inch and five-eighths; altitude one inch; breadth half an inch.

Dredged at Singapore.

A very delicate species, resembling in all its outlines small specimens of *Mya arenaria*. It affords a good example of the transition from *Mactra* to *Lutraria*, showing that there is no natural distinction. It is more widely gaping than most species.

Figures 496, 496 *a*, lateral and dorsal views of the shell.

MACTRA TRIANGULARIS, (LAMARCK); Anim. sans Vert., vi. 103. Encycl. Meth., pl. 253, f. 3, a b c.

From a series of specimens, I am able to trace this large species to the Lamarckian name given to a specimen only an inch in diameter, having at that stage a depressed, triangular form, very greatly differing from the ovate form it afterwards assumes, being then nearly of the form of *M. solidissima*. The delicate, crowded furrowing of the young shell becomes coarse; and the fine dewy mottlings become reddish-brown blotches, and it ought to be called *M. lentiginosa*. Some of the specimens are marked Feejees and some New Zealand. The former is more probably the true locality.

LUTRARIA MAXIMA (*Middendorff*).

Testa magnifica, ventricosa, ovato-rotundata, anticè rotundata, posticè sub-triangularis, truncata, valdè hians, concentricè undulato-striata, epidermide luteo-viridi (post costam medianam radiatim corrugato) induta; umbonibus tumidis, incumbentibus, attigentibus: cardo validus; foveâ latâ, obliquè triangulari; dente cardinali crasso, erecto, plicato, basi appendiculato; dentibus lateralibus compressis, conspicuis: interior calcarea; sinu siphonali linguiformi, dimidiam longitudinis testæ attigente.

Lutraria maxima, MIDDENDORFF; Beitrage zu einer Malacol. Rossica; abth. iii. p. 66, tab. xix., f. 1-4 (1849).

Lutraria capax, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 217. May 1850. Expedition Shells, 76.

SHELL large, capacious, rounded-ovate, rather light and thin, nearly equilateral, rounded anteriorly, somewhat triangular posteriorly, and at its point, where is a large oval opening. The surface is coarsely undulated concentrically, and covered with a coarse, yellowish-green epidermis, which, posterior to an indistinct rib running from the apex to the middle of the base, is more closely adherent and corrugated, so as to exhibit numerous delicate, darker rays. The beaks are tumid, and come in contact with each other. Hinge strong, with a large, broad, obliquely triangular fossa, a solid, erect folded tooth, with an acute appendage at its base, near the point of the beak. Lateral teeth

rather more elevated than usual, compressed. Interior chalky white, polished at the margin. Siphonal sinus linguiform, extending half the length of the shell.

Length five and three-fourths inches; height four inches; breadth three inches.

Inhabits Puget Sound. *Dr. Pickering.*

This is an extraordinary shell, and by far the largest species of the genus. It proves to have been described previously to the description published by me; but as it is a remarkable species, and the work of Middendorff not easily accessible, it is reproduced in this work.

Figure 508, 508 *a*, lateral and dorsal views of the shell; 508 *b*, the hinge.

PANDORA CISTULA (*Gould*).

Testa solida, alba, valdè inequilateralis, falciformis, anticè rotundata, posticè angustata, truncata: valva plana tenuis, submargaritacea, concentricè undulata; margine dorsali subrecto, latè inflecto, dente brevi, elevato, triangulari munito: valva concava solidior, ossea, tumida, posticè costato-angulata, edentula, fossâ ligamentali et costâ anticâ instructa; margine dorsali concavo; margine ventrali valdè arcuato.

Pandora cistula, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 217. May 1850. Expedition Shells, 77.

SHELL solid, bony, transversely elongate, very inequivalve and inequilateral, falciform; obtusely rounded anteriorly; gradually narrowing and strongly recurved posteriorly, and truncated at tip; right (flat) valve, thinner than the other and less recurved, the folded, posterior, dorsal edge, which shuts over the other valve being broad, flat, and nearly rectilinear; on the exterior is a submarginal, obtuse ridge; surface somewhat undulate concentrically, slightly pearly outside and inside. There is a single short, elevated, triangular tooth, and posterior, oblique, ligamentary groove. Left (concave) valve much more solid, bony, and dead white, the posterior umbonal slope tumid; the

superior dorsal edge strongly concave; a considerable ridge passes from the beak to the lower posterior angle; ventral edge strongly arched; hinge without a tooth, but with a deep, oblique ligament-groove, and an anterior marginal rib.

Length an inch and an eighth; breadth half an inch; height an inch and one-tenth.

Inhabits Patagonia.

More solid, more concave, and more elongated than any species I am acquainted with. The upper valve of a small specimen from the same locality is semicircular, but more acute anteriorly than posteriorly.

Figure 500, the shell open, with the hinge; 500 *a*, dorsal edge of the shell; 500 *b*, flat valve.

OSTEODESMA BRACTEATUM (*Gould*).

Testa parva, tenuis, transversa, inequilateralis, ovato-falcata, ventricosa, margaritacea, epidermide fusco radiatim creberrimè rugoso induta; latere antico rotundato; latere siphonali duplo longiore, triangulari, sub-adscendente, truncato; margine dorsali recto; margine ventrali arcuato, sub-pendulo: interior deaurata.

Osteodesma bracteata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 217. May 1850. Expedition Shells, 77.

SHELL extremely thin and fragile, translucent, pearly, nacreous and reflecting golden colours internally, and somewhat externally; form oblong-ovate, inequilateral, somewhat recurved; beaks acute, at the anterior third; anterior end obtusely rounded; posterior end triangular-elliptical, broadly truncated at tip, the basal portion, where the umbonal slope attains, being notably ventricose: basal margin at this part depending; anterior dorsal edge arcuate; posterior dorsal rectilinear, compressed. Surface covered with a dusky epidermis of considerable firmness, which is corrugated into numerous, delicate, radia-

ting, raised wrinkles, to which a coating of fine sand adheres. Hinge too imperfect for description.

Length three-fourths of an inch ; height three-eighths of an inch.

Inhabits Puget Sound, Oregon.

It is with some little doubt that I venture to separate this from *O. hyalina*; but considering its locality, and the fact that the species of this genus vary but little, I have regarded it as an analogous species. Indeed, if the four characters, viz., the gilded nacre, the dusky coloured epidermis, and the more numerous wrinkled epidermis, and the ventricose pouched form of the posterior basal portion, prove as constant as in the specimens I have examined, there can be no doubt.

Figures 509, 509 *a*, exterior and dorsal views of the shell; 509 *b*, the interior.

OSTEODESMA BRASILIENSE (*Couthouy MS.*) Gould.

Testa fragilis, elongato-ovata, anticè ventricosa et truncata, posticè compressa, concentricè undulata, epidermide flavicante induta; umbonibus ante-medianis, tumidis, approximatis; margine dorsali ferè rectilineari; margine ventrali arcuato: interior margaritacea: ossiculum parvum, oblongum.

Osteodesma Brasiliensis (Couthouy MS.); Proceed. Boston Soc. Nat. Hist., iii. 218. May 1850. Expedition Shells, 78.

SHELL fragile, elongated-oval, widely gaping posteriorly, sub-equi-valve, very inequilateral; beaks anterior, protuberant, contiguous; posterior half compressed; anterior half ventricose, its extremity abruptly truncated; lunule depressed, large, cordiform; dorsal margin nearly rectilinear, basal one curving regularly outwards; epidermis strong, dirty yellow, projecting some distance beyond the margins. Striæ of growth coarse and unequal. Interior silvery white; muscular impressions small, superficial; pallial impression angularly sinuated posteriorly. Ossiculum small, oblong, the posterior end rounded, the anterior square. [J. P. C.]

Length an inch and a half; height three-fourths of an inch.

A single specimen, with part of the animal, was found in a sandy cove, in the Bay of Rio Janeiro.

Its elongated, leguminous form, and its large size, plainly characterize it. In the specimen examined there is a deep strangulation near the anterior end, from the ventral margin half way to the beaks; but it is probably accidental, as the early stages of growth show no traces of it. It is the only species of the genus ever found in tropical seas.

Figures 510, 510 *a*, 510 *b*, lateral, internal, and dorsal views of the shell.

SAXIDOMUS NUTTALLI (CONRAD), Journ. Acad. Nat. Sc., vii. 249, pl. 19, f. 12.

Found at the Straits of De Fuca, much larger than described by Conrad, viz., three and a half inches long, and two and a half high. In the young state, it is invested with a fawn-coloured epidermis.

AMPHIDESMA CROCEUM (*Gould*).

Testa maxima, crassa, calcarea, inequivalvis, subcircularis, posticè hiantula et sub-truncata, liris concentricis reflexis interdum divaricatis arata, radiatim striata; umbonibus sub-medianis, eminentibus, acutis, contiguïs: intus crocea: cardo validus, foveâ ligamentali amplâ, profundâ; dentibus rosaceis.

Amphidesma croceum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 218. May 1850. Expedition Shells, 78.

SHELL large and ponderous, externally of a dead, dingy white, inequilateral, very inequivalve, the right valve twice as convex as the left, nearly circular; surface concentrically marked with delicate, irregular, sometimes divaricate, somewhat reflex, concentric wrinkles, more conspicuous at the ends; these are traversed by obsolete, un-

equal, radiating striæ, and when examined by a magnifier, the whole surface is found to have minute, undulating striæ. There is a very conspicuous Tellina-like fold posteriorly; the anterior end is a little the longer, somewhat less elevated than the posterior, which is a little truncated and slightly gaping. Beaks prominent, pointed, contiguous, with a small, lanceolate pit in front. Interior of a beautiful saffron tint; the portion to which the mantle adheres having a dead surface, marked with scattered, shining dots. Hinge very strong; ligament pit large and deep; teeth beautifully and deeply tinted rose-red.

Length three and a half inches; height three and a quarter inches; breadth one and a quarter inches.

Inhabits Callao. (?)

Very distinct from all other described species, unless it may be *A. solidum*, Gray. From comparison with his description alone, this must be different.

Figures 512, 512 *a*, exterior and interior of the shell.

MESODESMA MUNDUM (*Gould*).

T. parva, solidula, convexiuscula, ovato-triangularis, lævis, epidermide stramineo induta; natibus post-medianis, acutis; margine dorsali vix arcuato, posticè subitò declivi; latere antico angustato, acuto; latere postico rotundato; margine ventrali valdè arcuato: interior flavescens, cicatricibus impressis: cardo dentibus validis instructus.

Mesodesma munda, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 217. May 1850. Expedition Shells, 77.

SHELL solid, smooth, cream-coloured, inequilateral, compressed, ovate-trigonal, cuneiform, transverse; beaks elevated, acute, at the posterior third, forming a right angle; posterior extremity broadly rounded; anterior end subtriangular, acutely rounded, point below the middle; ventral margin regularly curved; anterior dorsal margin rectilinear. Interior yellowish-white; muscular impressions deep. Teeth well-developed, like *M. striata*.

Length three-fourths of an inch; height five-eighths of an inch; breadth three-tenths of an inch.

Inhabits Mangsi Island, Sooloo Sea.

Distinguished from *M. striata* by its more compressed, less angular form, its short, broad, rounded anterior end, there being no angle except at the beaks, and by its smooth surface. It may also be compared with *M. glabella*, Deshayes.

Figures 511, 511 *a*, lateral and dorsal views of the shell; 511 *b*, the hinge.

ERYCINA (PORONIA) OVATA (*Gould*).

T. parva, alba, nitida, concentricè striata, ovato-ventricosa, inequilateralis; margine cardinali arcuato; umbonibus parvis, antemedianis; margine ventrali parum arcuato; latere antico truncato; latere postico rotundato; valvæ dextræ dente cardinali erecto, bifido; foveâ ligamentali parvâ; valvæ sinistræ dente integro: intus alba.

Erycina (*Poronia*) *ovata*, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 218. Expedition Shells, 78.

SHELL small, thin, ventricose-ovate, inequilateral, shining, concentrically striate, and very minutely radiate-striate. Hinge margin rounded, the beaks a little before the middle, small, not prominent: basal edge but little curved; posterior end well rounded; anterior end truncate, a little obliquely. Hinge delicate, with a minute cardinal tooth, bifid in the right valve; lateral articulation but little developed; ligament pit small. Interior white.

Length three-twentieths of an inch; height one-fourth of an inch; breadth one-fifth of an inch.

Inhabits the Sandwich Islands.

Differs from the next species in its smaller size, more inequilateral and ventricose form, shining surface, and delicate hinge.

Figures 587, 587 *a*, lateral and dorsal views of the shell, enlarged ; 587 *b*, the hinge, magnified ; 587 *c*, natural size.

ERYCINA (KELLIA) QUADRATA (*Gould*).

Testa parva, tenuis, ventricosa, ad angulos rotundata, concentricè et concinnè striata, epidermide stramineo induta ; umbonibus ferè medianis, tumidis, antevergis : area cardinalis ampliata, in valvâ sinistrâ tridentata (dente mediano subulato, sub umbone sito ; alteris elongatis, compressis) in valvâ dextrâ bidentata ; fossâ ligamentali triangulari, declivi.

Erycina (*Kellia*) *quadrata*, GOULD ; Proceed. Boston Soc. Nat. Hist., iii. 252. June 1850. Expedition Shells, 78.

SHELL subquadrate, rounded at the angles, thin, nearly equilateral, ventricose, the anterior side somewhat less elevated than the posterior, with obtuse umbonal angles to the disk. Surface very delicately grooved concentrically, and covered with a straw-coloured epidermis. Beaks central, tumid, turned forwards. Hinge consisting of a shelf along the anterior dorsal edge of the left valve, on which are two divaricate teeth, sharp and ascendant, the anterior one sweeping off along the edge of the shelf ; behind the shelf is a triangular sinus, along which the cartilage is fixed ; there is a posterior lamellar thickening. Cardinal tooth wanting in the right valve.

Length half an inch ; height two-fifths of an inch ; breadth one-fourth of an inch.

Inhabits the Feejee Islands. (?)

A very large species of this type, resembling very much *Cyclas elegans*.

Figures 586, 586 *a*, lateral and dorsal views of the shell ; 586 *b*, the hinge, magnified.

PSAMMOBIA FLORIDA (Gould).

Testa transversa, oblonga, tenera, polita, purpurascens, posticè albo-radiata; limbo epidermide flavo-virescente induto; natibus postmedianis, inconspicuis; latere antico semi-elliptico, apice supra-mediano; latere siphonali angustato, acutè rotundato, apice infra-mediano; margine ventrali rectiusculo: interior incarnata; sinu siphonali angusto, prælongo; cardine dentibus duobus minutis divaricantibus in utrâque valvâ instructo.

Psammobia florida, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 254. June 1850. Expedition Shells, 81.

SHELL delicate, fragile, lucid, transversely oblong-oval, somewhat rhomboidal, very inequilateral, smooth and shining. Beaks delicate, at the posterior third; anterior end obliquely rounded, acutely above, less so below, tip above the middle; posterior end subtriangular, tip acutely rounded, below the middle; dorsal and ventral edges anteriorly parallel, posterior dorsal edge rapidly declining, angular. Valves slightly convex; epidermis shining, zoned indistinctly with livid flesh-colour and yellowish horn-colour, with two or three pale rays posteriorly; ligament elevated, short, pale chestnut. Interior livid brown; siphonal sinus narrow, extending two-thirds across the shell; muscular impressions distinct. Hinge with two minute, approximate, diverging teeth in each valve.

Length an inch and a quarter; height seven-tenths of an inch.

Inhabits Illawarra, New South Wales. *Drayton.*

A shell closely resembling in structure and exterior colouring *Machæra costata*. It has the form of *P. vespertina*, except that the beaks are removed much farther backwards.

Figures 513, 513 *a*, lateral and dorsal views of the shell; 513 *b*, the hinge.

TELLINA CONCENTRICA (*Gould*).

T. transversa, ovato-trigona, tenuis, convexiuscula, albida, haud nitida, ubique concentricè lamellosa, et radiatim inter lamellas subtilissimè striata; lamellis æqualibus, acutis, confertis, reflexis; umbonibus vix post-medianis: pars antica semi-elliptica; margine dorsali vix declivi: pars postica sub-triangularis; margine dorsali valdè declivi, sub-arcuato, valdè excavato, ad apicem truncato; flexurâ conspicuâ, haud lamellosâ: intus alba.

Tellina concentrica, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 253. June 1850. Expedition Shells, 80.

SHELL thin, transversely-ovate triangular, subequilateral, white outside and in, ornamented with numerous, equally-spaced, thin, concentric lamellæ, about equally developed throughout; and having the interspaces marked with very delicate, radiating striæ; beaks a little past the middle, acute, compressed; anterior dorsal slope slightly declining, rectilinear; extremity broadly rounded; anterior umbonal slope tumid; posterior dorsal slope nearly rectilinear, rapidly declining, tip truncated; flexure well-marked; ligament cavity long and deep; shell broadest at anterior third. Lateral teeth remote, the posterior one conspicuous, the anterior one less so.

Length an inch and five-eighths; height an inch and one-eighth; breadth half an inch.

Inhabits the Feejee Islands.

Like *T. capsoides*, Lam., but less triangular, the anterior portion more tumid, and its dorsal slope arcuate; the flexure is more decided; the concentric laminæ decided and uniform throughout; the radiating striæ are very delicate, and found equally before and behind, not crossing the concentric laminæ. It is much like *T. pristis*, Lam., except in form, and its anterior dorsal margin, which is represented as serrated.

Figures 519, 519 *a*, lateral and dorsal views of the shell; 519 *b*, the hinge.

TELLINA TITHONIA (*Gould*).

Testa transversa, oblonga, subequilateralis, zonis et radiis diversis albis et roseis picta, concentricè lirata, liris posticè lamellosis; latere antico semiovali; latere postico breviori, triangulari, ad apicem truncato; plicâ profundâ; margine dorsali recto, declivi: interior incarnata, ad marginem roseo-maculata, versus apicem lutea; dentibus lateralibus satis conspicuis.

Tellina tithonia, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 252. June 1850. Expedition Shells, 79.

SHELL twice as long as broad, beaks somewhat behind the middle; anterior half semi-elliptical, rounded at the extremity, superior edge rectilinear, basal edge very slightly curved; posterior end triangular, much curved to the right; superior edge straight, declivous, extremity truncated; fold very decided; surface everywhere sculptured with deep, close, parallel, equal, simple grooves and ridges, which become lamellar as they pass the fold; colour milk-white, zoned and rayed with roseate; within deep flesh-coloured, cream-coloured toward the beaks; margin pencilled with the termination of the external red rays; lateral teeth well developed.

Length an inch and three-fourths; height seven-eighths of an inch.

Inhabits the Sooloo Sea.

Intermediate between *T. rastellum* and *T. pulchella*, being smaller and of the same shape as the former, but without its peculiar squamous sculpture of the right valve; and being larger and more roseate than the latter, and from a very different locality. It is coloured like *T. virgata*, externally, but is more slender, and deeply coloured within also. It has the form and sculpture of *T. maculata*.

Figure 518, lateral view of the shell; 518 *a*, interior, with the hinge; 518 *b*, dorsal view of the shell.

TELLINA COMPTA (Gould).

T. parva, transversa, inequilateralis, alba vel rubescens, quater roseo-radiata; apicibus ad trientem posticum sitis; latere antico semi-elliptico; latere siphonali triangulari apice truncato, vix insculpto, plicato; marginibus (scilicet dorsali et ventrali), ferè parallelis; disco striis concentricis et striis obliquis arato; dentibus lateralibus nullis; intus ex albo flavescens, radiatim striata.

Tellina compta, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 253, June 1850. Expedition Shells, 79.

SHELL small, transverse, rather ventricose, inequilateral, white, with four delicate rays of rose-colour, within and without, shining, with delicate, concentric striæ, crossed by oblique striæ, which extend to the fold posteriorly, and to near the upper anterior margin; anterior end twice the length of the posterior; margins (ventral and dorsal) nearly parallel, regularly rounded at extremities; basal margin slightly arcuated, posterior end triangular; dorsal margin very oblique, outline gibbous; fold scarcely perceptible; cardinal teeth two in one valve, one in the other, bifid; lateral teeth wanting; within white, varied with cream-colour, radiately striate; somewhat gaping posteriorly.

Length five-eighths of an inch; height one-third of an inch; breadth one-third of an inch.

Almost precisely like *T. decora*, which has a well-marked lateral tooth, and comes from the West Indies. *T. rhomboides*, Quoy, varies chiefly in the more partial development of oblique striæ. The colouring is less brilliant, and the striæ more delicate, more oblique, and cover a greater portion of the valve than *T. lauta*, though of the same size and form.

Figure 515, lateral view of the shell, enlarged; 515 *a*, interior of the shell; 515 *b*, the back of the shell, in outline.

TELLINA EXCULTA (Gould).

T. transversa, solida, trigono-elliptica, tumida, nitida, albida, rosaceo vix radiata, concentricè liris tenuibus et radiatim striis tenuissimis insculpta; liris in valvâ dextrâ posticè lamellosis et interruptis, squamas simulantibus; in valvæ sinistræ disco valdè obliquis; apicibus postmedianis; latere anticali semi-elliptica; latere posticali subtriangulari, ad apicem valdè truncato; flexurâ insigni, haud lamellosâ: cavositas flava; dentibus valvæ dextræ conspicuis.

Tellina exculta, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 253. June 1850. Expedition Shells, 80.

SHELL transversely elongated, triangular elliptical, tumid, inequilateral, rather solid, shining, with alternate watery and snow-white zones, and vestiges of numerous faint rust-coloured rays. Beaks behind the middle, small; anterior end the half of an elongated ellipse, with the upper margin a little less curved than the basal; posterior end triangular, the dorsal margin rectilinear and rapidly declining, tip decidedly truncate, flexure very strongly marked, biangular; right valve delicately grooved concentrically, the ridges imbricating backwards; posteriorly they become lamellar and are interrupted at short distances, so as to resemble rasp-like scales; the whole decussated by very delicate radiating striæ: left valve concentrically grooved like the right valve, except a posterior triangular space where they terminate abruptly; none of them are lamellar, and on the central portion they shoot obliquely downwards: this valve has also a series of minute, radiating striæ: the portion occupied by the flexure is destitute of sculpture in both valves. Ligament small, moderately imbedded. Interior sulphur-yellow, whitish at margin. Lateral teeth in the right valve strongly developed. There are little radiating capillary venations on the disk of both valves, sometimes plainly seen by transmitted light.

Length two inches; height one inch; breadth nearly half an inch.

Inhabits the Feejee Islands.

Looks like a variety of *T. rastellum*, Hanley (*T. Philippii*, Anton), but is proportionally shorter, the disk is more tumid anteriorly; the beaks are farther back; the concentric laminæ of the right valve are everywhere more delicate, but on the anterior half they are smoothly reflected or almost wanting, so as to have a gloss: the portion where the laminæ are interrupted, giving the peculiar scale-like appearance, is very limited, and confined to this valve, in front of the fold; left valve nearly destitute of lamination, shining, with very delicate radiating striæ, and the oblique grooving on the centre of the disk is very decided. The folds are very decided and destitute of lamination on both valves. On one specimen, very faint rusty radiations are discerned; on another, the beaks are stained bright red, much like *T. crucigera*.

Figures 517, 517 *a*, lateral views of both valves; 517 *b*, dorsal view of the shell.

TELLINA LAUTA (*Gould*).

T. parva, solidiuscula, oblonga, inequivalvis, umbonibus ad trientem posticalem longitudinis sitis; latere antico semiovali, margine dorsali recto, latere postico triangulari ad apicem truncato; valvis concentricè liratis (liris cum striis obliquis anticè decussatis) albis, roseo quadri-radiatis et anticè lineis araneosis rosaceis ornatis; flexurâ inconspicuâ: cardo dentibus lateralibus carens.

Tellina lauta, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 252. June 1850. Expedition Shells, 79.

SHELL small, solid, transverse, beaks at the posterior third; anterior half semi-elliptical, upper edge straight, rather declining; end rather sharply rounded; posterior half triangular; upper edge straight, strongly declining; tip truncated; fold indefinite; altitude greatest a little in front of beaks; lines of growth finely grooved, decussated by slightly oblique lines on the two anterior thirds of the shell; colour white, cherry-red at the beaks, and with four broad, conspicuous rays of the same colour, the two anterior ones made up of numerous capillary lines, and these lines are also found on the intermediate white spaces; interiorly thickened, tinted cream-colour; the red rays being

most conspicuous at margin, the reverse of the exterior; lateral teeth undeveloped.

Length seven-tenths of an inch; height four-tenths of an inch.

Habitat unknown.

About the size, form, and colouring of *T. Valtonis*, Hanley, which appears to be a polished, pellucid shell, with no peculiarity of sculpture. It is very near to *T. rhomboides*, Quoy, which is said to have fine, concentric striæ anteriorly, that become obsolete at the middle.

Figure 514, outside of the shell, enlarged; 514 *a*, interior of the shell; 514 *b*, dorsal view, in outline.

TELLINA PERULA (Gould).

T. parvula, solidiuscula, ventricosa, rotundato-triangularis, eburnea, concentricè et remotè striatula; apicibus tumidis, submedianis, radiis binis lacteis ornatis; marginibus dorsalibus valdè declivibus; latere antico rotundato, tumido; latere siphonali brevì, valdè flexuoso, infra angulato; margine ventrali pendulo; cavositatis limbo albo, disco sulphureo; dentibus lateralibus conspicuis.

Tellina perula, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 254. June 1850. Expedition Shells, 80.

SHELL minute, rather solid, polished and shining, subequilateral, ventricose, subglobose, rounded ovate-triangular, ivory-white with two milk-white umbonal rays on the beaks; beaks a little behind the middle; anterior dorsal edge nearly rectilinear, extremity acutely rounded; posterior dorsal margin rapidly sloping, rectilinear; tip acute, slightly truncated; flexure angular, well marked; ventral margin pendulous or much arcuated; centre of the disk tumid; surface having distant, very shallow, concentric grooves; shell broadest at the middle; within, white at margin, sulphur-yellow centrally, with the two white rays in the cavity of the beaks corresponding to those on the outside: well-developed lateral teeth at both ends.

Length half an inch; height two-fifths of an inch; breadth three-twentieths of an inch.

Inhabits the Feejee Islands. *Mr. Hawkins.*

Very much like *T. casta*, Hanley, which is described as pellucid, and no mention is made of the yellow colour of the interior, or of the two white umbonal radiations. One specimen is tinted and zoned with rose-red, and the interior is wholly red, preserving, however, the umbonal white rays. The distant concentric ridges, like a rubbed *Lucina Jamaicensis*, are worthy of notice.

Figure 516, exterior of a red and white specimen; 516 *a*, inside of a white specimen; 516 *b*, dorsal view; 516 *c*, hinge.

DONAX PALLIDUS (*Gould*).

Testa transversa, ovato-triangularis, solidula, convexa, exalbida, posticè concentricè sulculata, anticè polita; apicibus post-medianis; margine dorsali utrinque declivi (præcipuè retrorsum) arcuato; latere antico semi-ovali, sensim angustato, ad apicem rotundato; latere postico subtriangulari, rotundato; margine ventrali valdè arcuato, posticè sinuato: interior eburnea, incrassata; dentibus modicis.

Donax pallidus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 254. June 1850. Expedition Shells, 81.

SHELL transverse, ovate-triangular, inequilateral, rather solid, disk tumid, dead yellowish-white, anterior portion smooth, and with very delicate, radiating striæ; posterior portion with delicate concentric furrows; beaks two-fifths the distance from posterior end, which is short, triangular, with the margins swelling, and the angle rounded; anterior end semi-elliptic, the dorsal margin gently sloping and swelling, the tip rounded: within, ivory-white, tinged with a little flesh-colour, thickened; cicatrices deeply marked; hinge rather delicate, especially the lateral teeth; the lower margin is regularly arcuate, except posteriorly, where it is a little sinuate.

Length three-fourths of an inch; height half an inch; breadth one-fourth of an inch.

Inhabits Singapore.

The outlines are all gently rounded, and it is otherwise distinguished by its dead, sallow white colour, and its sculpture.

Figure 520, lateral view of the shell; 520 *a*, interior, with the hinge; 520 *b*, dorsal view of the shell.

DONAX TINCTUS (*Gould*).

Testa crassa, ovato-trigona, cuneata, versicolor, scilicet incarnata, straminea vel violacea, striis lamellosis concentricis posticè flexuosis insculpta; apicibus ferè medianis; margine interiori integro; dente laterali valido; dente antico obsoleto.

Donax tinctus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 255. June 1850. Expedition Shells, 81.

SHELL thick and solid, triangular, wedge-shaped, with the beaks nearly central, the angles rounded, and the two sides nearly equal. Surface marked with regular concentric lamellar striæ, which, at the posterior end, become delicately flexuous, giving this extremity a rugose aspect. The colour varies; one specimen is pale carmine, much more intense at the beaks, and of the same tint in the interior; another is straw-coloured; another a pale violet-colour, slightly radiated, clouded with deep violet within. The posterior lateral tooth is fully developed, but the anterior one scarcely appears. The margin is entire.

Length eight-tenths of an inch; breadth two-fifths of an inch; height seven-tenths of an inch.

Habitat unknown.

The specimens I have examined vary very much in colour, yet

correspond in form, sculpture, and other characters. It comes near to *Donax cuneata*, but is still nearer to *Mesodesma striata* in general aspect.

Figures 521, 521 *a*, lateral and dorsal views of the shell.

DONAX CROCATUS (Gould).

Testa parva, tenuis, transversa, ovato-triangularis, inequilateralis, dilutè crocea, concentricè lamelloso-sulcata; latere antico semi-ovato; latere postico breviori, arcuatim-truncato; margine ventrali lentè arcuato: intus flavida, nitida; cardine valido.

Donax crocatus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 255. June 1850. Expedition Shells, 82.

SHELL minute, thin, compressed, convex, transversely elongate, ovate-triangular, inequilateral, concentrically lamellar sulcate, of a pale saffron-colour, with minute transverse lineations of a darker colour; outlines rounded; beaks not quite at the posterior third, dorsal outline forming an obtuse angle; anterior end acutely ovate; siphonal end obtusely rounded, somewhat truncate: ventral margin slightly arcuate. Interior yellowish, shining, hinge well developed.

Length two-fifths of an inch; height one-fourth of an inch; breadth three-twentieths of an inch.

Inhabits Mangsi Island, Sooloo Sea.

This small species is sufficiently well characterized, and is somewhat like *D. scalpellum*.

Figures 522, 522 *a*, lateral and dorsal views of the shell, magnified; 522 *b*, natural size.

LUCINA INCULTA (Gould).

Testa tenuis, lenticularis, retrorsum admodum obliqua, stramineo-albida,

concentricè striolata; apicibus medianis, elevatis, acutis, contiguïs, antrorsum versis; latere antico supernè subangulato, excavato; latere postico rotundato, infra paululum producto: cavositas albida; cicatricibus conspicuis: cardo invalidus; dentibus apicalibus duobus divaricatis, lateralibus nullis.

Lucina inculta, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 255. June 1850. Expedition Shells, 82.

SHELL small, thin, lenticular, equilateral, nearly circular; dull white colour; surface rude, with no sculpture save the slight concentric undulations produced by irregular stages of growth. Beaks slightly elevated, rather compressed, acutely triangular, incurved, a slight depression in front of them rendering the anterior half a little less elevated than the posterior; anterior end somewhat acutely rounded; posterior and basal margins circularly rounded, most depending portion a little behind the middle: valves moderately convex, greatest breadth a little behind the centre. Interior dead, dirty white; margin simple; hinge delicate; cardinal teeth two in each valve, divergent, one of which is bifid, none lateral. Ligament external, having a golden metallic lustre.

Diameter three-fourths of an inch; breadth three-eighths of an inch.

Inhabits New Zealand.

Very much like *L. flan*, but is much smaller, more solid, and less glossy. The anterior end is less developed, and the bulk of the shell, as well as its most depending portion, is behind, instead of before the beaks.

Figure 524, side of the shell; 524 *a*, inside and hinge; 524 *b*, back of the shell.

LUCINA LENTICULA (*Gould*).

Testa parva, solidula, lenticularis, rotundata, convexiuscula, concentricè imbricato-striata, etiam striis radiantibus decussata, alba, epidermide fuliginoso hic illic induta; apicibus ferè medianis, prominulis: cardo

dentibus apicalibus et lateralibus tenuibus instructus: intus incrassata, alba; margine crenulato; impressionibus profundis.

Lucina lenticula, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 256. June 1850. Expedition Shells, 83.

SHELL small, rather solid, nearly circular, subequilateral, lenticular, moderately convex, the apex nearly central, slightly elevated, and a little inclined forwards, forming a very shallow anterior pit. The surface is rude and chalky, with concentric wave-striæ, decussated by numerous fine, radiating lines, mostly denuded, but with remains of a dusky, thick epidermis at the margin. Hinge delicate, with minute, diverging cardinal teeth, and somewhat distant, sufficiently conspicuous lateral ones. Interior chalky white, incrassated within the pallial impression, which is deep, and jagged at the margin: edge delicately crenulated.

Diameter two-fifths of an inch; breadth three-tenths of an inch.

Probably from Rio Janeiro.

This little shell has rather the aspect of an *Astarte* or *Cyprina*, and would be considered as such, were it not for its lateral hinge-teeth.

Figures 528, 528 *a*, lateral and dorsal views of the shell; 528 *b*, the hinge.

LUCINA VESICULA (*Gould*).

Testa tenuis, sub-globosa, vix obliqua, pallidè flavescens, concentricè tenui-striata, radiatim obsoletè striata: apicibus submedianis, elevatis, anteversis; margine dorsali anticè excavato, demum sub-alato, posticè rectiusculo, peripheriâ relictâ circulari; cardine edentulo; ligamento in fossam obliquam internam posito: cavositas flavescens, punctis nitidis notata.

Lucina vesicula, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 256. June 1850. Expedition Shells, 82.

SHELL thin and fragile, yellowish-white, sub-globose, a little oblique, nearly equilateral; surface marked only by fine incremental striæ, which occasionally mark arrests of growth, and by microscopic diverging lines. Beaks slightly anterior, swollen, a little elevated above the transverse dorsal margin, strongly antrorse, with a decided emargination in the outline, in front of them; anterior end compressed; posterior half higher than the anterior; dorsal margin horizontal and rectilinear, then curving abruptly, it sweeps round the ventral portion in nearly a regular circle, a little oblique, however, so as to bring the most depending portion behind the middle. Valves ventricose. Within, plain yellowish-white, disk with a dead ground, sprinkled with shining punctures; edge minutely lineated. Hinge delicate, without cardinal teeth, and with only an oblique, anterior ligamentary groove resting on a rib-like support.

Length an inch and a quarter; height an inch and an eighth; width seven-eighths of an inch.

Inhabits the Tonga Islands. *Dr. Pickering.*

Its surface is like *L. filan*, but its form is more ventricose, and its dorsal margin is much less sloping, somewhat alate; and this is one of its most striking peculiarities. In form it is more like *L. undata*, except that the reverse extremities correspond.

A Singapore species has the same form, but the beaks are more elevated, and have a pit before them; the hinge is more delicate; the ligament groove is less oblique, and with a less substantial rib-support; surface more free from striæ. It probably belongs to the genus *Loripes*.

Figure 525, exterior of the shell; 525 *a*, inside, with the hinge; 525 *b*, dorsal view of the shell.

LUCINA RAMULOSA (*Gould*).

Testa crassa, scabra, lenticularis, vix obliqua, albida, costulis radiantibus crebrè divaricantibus et filis continuis concentricis crebris insculpta; apicibus elevatis acutis antrorsum versis; lunulâ excavatâ, haud insculptâ: cavositas albida vel citrina, incrassata; cicatricibus

*profundis ; limbo concinnè radiato-striato ; cardinis dentibus laterali-
bus validis.*

Lucina ramulosa, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 255. June 1850. Expedition Shells, 82. *Lucina fibula*, REEVE; Conch. Icon.

SHELL incrassated, nearly equilateral, subcircular, moderately convex, dingy white; surface reticulated with numerous rounded, radiating ridges, which by divarication become constantly increased in number, especially at the extremities, where they become recurved, thereby maintaining nearly a uniform size throughout. These ridges are crossed by more delicate or more crowded concentric ridges, which are not interrupted by the radiating lines, but ride over them. The lines of increase are also irregular, and often exhibit distinct stages of growth. Beaks a little anterior and strongly antrorse, scarcely raised above the outline of the shell, and having a deeply excavated, broad, lanceolate lunule in front: the posterior dorsal margin sweeps off directly from the apex, and with a slight posterior truncation the remaining outline is circular. Interior thickly incrassated, showing various indentations, especially one down the centre, of a pale citron-yellow colour; limbus marked with fine, radiating sulcations; cardinal teeth delicate; lateral ones well developed.

Diameter one inch; breadth half an inch.

Inhabits the Paumotu Islands, and was collected at Raraka, Clermont Tonnerre, Bellinghausen, Carlshoff, and Honden Islands.

As much allied to *L. tigrina*, or *L. interrupta*, as to any described species, but is more circular, more solid, and the peculiar divergence of the radiating ridges, somewhat like *Cytherea divaricata*, are sufficiently characteristic of it.

Figure 523, lateral view of the shell; 523 *a*, inside, with the hinge; 523 *b*, dorsal view.

CARDITA PROCERA (*Gould*).

Testa elevata, ovato-triangularis, radiatim ad quindecim-sulcata (inter-

stitiis convexiusculis) concentricè striata, epidermide fulvo induta; apice mediano, acuto, obliquo; cardo dente unico triangulari obliquo, instructus; margine interno sulcato.

Cardita procera, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 276. July 1850. Expedition Shells, 83.

SHELL small, elevated, height and breadth equal, equilateral, slightly convex, quadrant-shaped, with about fifteen radiating sulci, the interspaces forming rounded, slightly elevated ribs; concentrically striate, with occasionally a larger one indicating a stage of growth: apex acute, slightly curved, margin in front of it a little excurved; cavity of interior small, margin crenulated, white: hinge with a single, triangular, oblique, strong tooth.

Length three-fifths of an inch; height three-fifths of an inch; breadth one-fifth of an inch.

Inhabits the mouth of Rio Negro, Patagonia. *Couthouy*.

It has a more compressed and less oblique form than *C. borealis*, and fewer ribs. The right valve only was obtained.

Figure 533, lateral view of the shell.

CARDITA VENTRICOSA (*Gould*).

Testa solida, ventricosa, ovato-trigona vix obliqua, radiatim ad viginticostata, costis concentricè subnodosis, interstitiis angustis, epidermide fuliginoso, villosa induta; apicibus submedianis, obtusis: intus alba; margine profundè crenulato; dente cardinali valvæ dextræ, elevato, crasso, triangulari.

Cardita ventricosa, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 276. July 1850. Expedition Shells, 83.

SHELL small, solid, very slightly oblique; beaks tumid, elevated, nearly central, slightly curved, eroded; valves tumid, with about eighteen or twenty rounded, well-defined, radiating ribs, which are

crossed by numerous inconspicuous, nodular, concentric bars, most distinct about the umbones, covered with a rusty-brown, velvety epidermis, the pile set in radiating ranges, especially in the intercostal spaces. Hinge of the right valve with a strong, elevated, oblique, triangular tooth, defined by deep furrows each side, its apex detached from the margin of the shell, acute; marginal crenulations deep, well defined.

Length three-fourths of an inch; height five-eighths of an inch; breadth half an inch.

Inhabits Puget Sound, Oregon.

Compared with *C. borealis*, Conr., it is thicker, less transverse, more tumid at the beaks, which are less recurved; the ribs are barred; the cardinal tooth is short, triangular (not long falcate) and detached from the margin; the crenulations of the margin deeper.

Figures 532, 532 *a*, lateral and dorsal views of the shell.

CARDIUM BLANDUM (*Gould*).

Testa parva, tenuis, subcircularis, vix transversa, ventricosa, posticè subtruncata, cinereo-rufescens, costis planulatis radiantibus ad quadriginta insculpta, sulco angusto sejunctis, et liris concentricis tenuissimis, arcuatis, reflexis, decussatis: apicibus medianis, tumidis, nudatis, eburneis: cavositas albida; margine interno crenulato; cardine debili.

Cardium blandum, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 276. Expedition Shells, 83.

SHELL small, thin, ventricose, equilateral, subcircular, or a little transversely oval, yellowish-white, with a thin, closely adhering, fawn-coloured epidermis; posterior umbonal slope a little angular, and posterior tip a little truncated: beaks prominent, acute, incurved or slightly antrorse: surface sculptured with upwards of forty radiating ribs, separated by narrow grooves; the ribs have the presenting surface flattened, which, however, at the later stages of growth, and

especially at the anterior end, are raised into delicate, arched, obtuse, crowded, somewhat imbricating, concentric ridges, only seen on careful examination; the grooves are also barred by delicate transverse folds. The ribs are not wanting, but almost disappear in front of the beaks. Interior with the central portion cream-coloured, margin exterior to the pallial impression pale clay-colour: internal edge with five short crenulations. Hinge delicate.

Length seven-eighths of an inch; height four-fifths of an inch; breadth three-fifths of an inch.

Inhabits Puget's Sound, Oregon.

I at first supposed this to be the young of *C. Californianum*, but on closer examination find that there are about ten more ribs; and the sculpture, instead of exhibiting, even in its earliest stages, granules along each angle of the ribs, and afterwards coalescing to form a transverse varix, is quite different. It seems to be the analogue of *C. Icelandicum*. The two ends are very nearly alike, but the whole shell varies from circular to transverse oval. The ribs in that are acute, and proportionally narrower, and the fringed epidermis is peculiar.

Figures 534, 534 *a*, lateral and dorsal views of the shell.

VENUS TOREUMA (*Gould*).

Testa ventricosa, subglobosa, vix obliqua, straminea lituris angulatis rufis picta, concentricè porcata; liris numerosis ad latera granulosis, acutis, crenulatis; interstitiis minutissimè striatis, et lineolis angulatis pallidis quasi indentatis; apicibus submedianis, tumidis, obliquis: lunula profunda, latè cordata: intus pallida; margine crenulato: cardo validus; dente postico valvæ sinistræ longitudinali; dente antico bi-ramoso.

Venus toreuma, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 277. July 1850. Expedition Shells, 84.

SHELL small, subglobose, nearly equilateral, slightly oblique: ante-

rior end smallest, acutely rounded: posterior end broadly rounded, obscurely truncate: colour dingy white, with numerous tented rusty blotches, the larger ones arranged somewhat in four radiating series; exceedingly delicate ones are interspersed. Surface sculptured with numerous, equidistant, moderately elevated, concentric ridges, the edges of which are crenulated by decussating wrinkles, and the interspaces marked by very fine concentric lines, and so articulated with very short dead-white and yellowish-white ones as to appear indented or chased in quincunx: valves ventricose, beaks tumid, anterior lunule deeply impressed, broad cordate. Within yellowish, edge finely crenulate, and somewhat blotched posteriorly. Hinge strong: anterior tooth parallel with the margin, elongated, and with a terminal denticle in the left valve: central tooth sub-bifid.

Length an inch and three-eighths; height an inch and a quarter; breadth nine-tenths of an inch.

Obtained at Mangsi Island, Sooloo Sea.

In general characters allied to *V. verrucosa*, but is more orbicular, more tumid, and its sculpture far more delicate and elaborate; besides which it is beautifully ornamented with tent-like markings, and the deceptive quincunx appearance in the intercostal spaces, like the general sculpture of *Terebratula*, caused rather by the cream-coloured opaque lines than by indentation, is very singular.

Figures 537, 537 *a*, lateral and dorsal views of the shell.

VENUS RIGIDA (*Gould*).

Testa solida, transversa, ovato-ventricosa, inequilateralis, desuper visa acutè ovalis, sordidè alba, striis concentricis reflexis, utroque laminosis, et striis crassis radiantibus decussata; decussationibus anterioribus punctatis; apicibus elevatis, antevergis, contiguïs: lunula lata, vix circumscripta: latere antico angustato, rotundato; latere postico latè et obliquè truncato; margine dorsali rectiusculo; cardine in dextrâ valvâ dentibus duobus fissis, in valvâ sinistrâ dente unico fisso: intus porcellana; margine crenulato.

Venus rigida, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 277. July 1850. Expedition Shells, 85.

SHELL large, inequilateral, transversely ovate, ashy white, more or less compressed; beaks near the anterior third, pointed, antrorse, with an indistinct, broad, lanceolate areola in front; anterior side two-thirds the height of the posterior, rounded at the end, dorsal margin compressed; posterior side a little gaping, slightly truncate at end, dorsal edge broad, nearly rectilinear, and horizontal; beaks smooth or delicately striate: surface grooved with radiating lines, much the deepest and most distant posteriorly, decussated with concentric laminæ, about equally distant, reflex especially at the anterior end, where they are most developed; on the posterior umbonal slope many of the concentric ridges disappear; the decussating points anteriorly are deeply pitted. Interior dull porcelain-white; ventral margin simple or finely crenulate in old specimens. Hinge strong, with three teeth in each valve, the central one in both valves, and the posterior one in the right valve, bifid. Siphonal sinus lanceolate, reaching to nearly under the beaks.

In one specimen, length three and three-fourths inches; height two and three-fourths inches; breadth one inch and one-half. Of another, length two inches; height one and five-eighths inches; breadth one inch and one-fifth.

Inhabits Oregon, Puget Sound, and Straits of De Fuca. *Mr. Case. Dr. Pickering.*

Has the form and general aspect of *Saxidomus Nuttalli*, Conrad, in which the hinge teeth are quite different, being more divergent, the central tooth being actually divided, and having moreover a supplementary one in front; and there are no traces of diverging lines. The sculpture is much finer than in *V. Dombeyana*, and more like that of *V. decussata*. It varies considerably in its size and proportions, being often much more expanded.

Figure 538, side of a dilated specimen; 538 *a*, side of a medium specimen; 538 *b*, dorsal view of the latter.

ARTHEMIS LAMBATA (Gould).

Testa tenuis, cordato-orbicularis, lenticularis, sordidè alba, radiatim tenuissimè striata et liris concinnis concentricis, posticè laminosis insculpta; apicibus sub-medianis elevatis, acutis, antevergis; margine dorsali postico declivi, vix arcuato: lunula profunda, lanceolato-cordata: interior albida; sinu siphonali obliquo, acuto; cardine dentibus tribus divergentibus in utràque valvâ.

Arthemis lambata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 277. July 1850. Expedition Shells, 84.

SHELL thin, lenticular, nearly circular, somewhat cordate, nearly equilateral, of a brownish-white colour, shining. Surface very finely grooved concentrically, some of the ridges rising into sharp laminae at the extremities; a faint granular appearance is also produced by microscopic radiating striæ; beaks a little anterior, elevated, acute, strongly antrorse, excavated in front, and having a deeply impressed, lanceolate, cordate lunule: anterior end somewhat compressed, regularly rounded; posterior end broader, more elevated, dorsal slope a little arcuate, rapidly declivous, tip not truncate: ventral margin nearly circular, a little oblique. Interior dingy white; margin simple; siphonal sinus diagonal, acutangular, deep. The hinge has three divergent lamellar teeth in each valve.

Length one inch; height nine-tenths of an inch; breadth half an inch.

Drawn up on the anchor at the Bay of Islands, New Zealand. *Archer.*

A. lincta is more elevated, has the ridges about twice as large, is destitute of radiating striæ, is more solid, and has the ligament margin excavated and the siphonal sinus more slender and acute. It is rather larger in size.

Figures 536, 536 *a*, lateral and dorsal views of the shell.

VENUS CALCAREA (Gould).

Testa ovato-rotundata, alba, crassa, inequilateralis, posticè subtruncata, striis concentricis, irregularibus, remotis, lamellosis signata; natibus acutis, attigentibus; lunulâ duplici, ovato-lanceolatâ; intus candidissima; margine crenulato.

Venus calcarea, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 277. Expedition Shells, 85.

SHELL ovate-triangular, nearly as high as wide, white, thick and heavy, inequilateral, slightly truncated posteriorly; surface marked with distant, irregular, somewhat lamellar, concentric ridges, the principal ones being about fifteen in number: beaks smooth, pointed, and touching each other; lunule appearing somewhat double, the outer one ovate-lanceolate; ligament deeply buried. Interior dead chalky white within the pallial impression, polished milk-white outside of it. Margin finely crenulate.

Length two and a half inches; height two inches; breadth an inch and two-fifths.

Inhabits New Zealand.

This remarkable shell is closely allied to *V. exalbida* and *V. mercenaria*. It is of a purer white than either, and more elongated, and with much fewer concentric rugæ than the former; nor has it any radiating striæ.

ARCA SOBRIA (Gould).

Testa transversa, inequilateralis, rhomboidea, alba, costulis rugosis numerosis radiantibus, posticis majoribus, instructa, et undulis remotis concentricis subreticulata; latere antico angusto, rectangulari, in marginem ventralem posticè desinente; latere postico obliquè truncato, ad apicem acuto; apicibus elevatis, angulatis; areâ cardinali angustâ, lanceolatâ: cardo dentibus ad octo utrinque instructus.

Arca sobria, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 278. July 1850. Expedition Shells, 85.

SHELL of moderate size, transversely elongate, rhomboidal, rather thin, white; superior margin straight; anterior margin forming a right angle with the dorsal margin, then sweeping round in a regular curve into the ventral margin; posterior margin very obliquely truncate, joining the basal margin at an acute angle; ventral margin moderately gaping. Beaks large, elevated, nearly smooth; posterior slope angular. Surfaces sculptured with numerous and delicate ribs, rendering the surface somewhat nodulous; behind the umbonal angle are five or six much larger bulging ribs, concentrically plicate, the intervening spaces smooth; at the anterior end are also some larger ribs. Cardinal area large, narrow-lanceolate, with grooves in lozenge; hinge edge delicate, with about eight delicate teeth at each end, and a few denticles between, the posterior one very oblique. Basal margin finely crenulate.

Length an inch and three-fourths; height nine-tenths of an inch; breadth seven-tenths of an inch.

Habitat unknown.

It has the outline of *Arca Deshayssi*, but is much smaller, more slender, more numerous ribbed, less acute posteriorly.

Figure 560, the side; 560 *a*, the back; 560 *b*, the hinge.

NUCULA SULCULATA (*Couthouy MS.*) Gould.

Testa transversa, inequilateralis, ovalis, nitida, concentricè sulculata, epidermide olivaceo induta; natibus tumidis; latere postico attenuato, sub-rostrato, vix truncato; latere antico rotundato; margine ventrali arcuato; declivitate postico angulato: lunula ovalis, bene impressâ.

SHELL thick and solid, transversely oval, anterior extremity obtusely rounded, smooth; posterior part attenuated, subrostrate, slightly truncated a little obliquely, with an obtuse ridge extending from the lower angle to the beaks; midway between this angle and the upper margin

is a feebly-impressed line, vanishing as it approaches the beak; basal margin regularly curved; beaks anterior, protuberant, incurved, and contiguous. Lunule deeply impressed, large, oval, faintly striated by the growth of the shell; margins of the valves forming a slight ridge through the middle. Escutcheon strongly marked, broadly elliptical, extending from the beak to the extremity, and limited by a deeply-impressed line, its surface shining and faintly striated, and of paler colour. Valves sculptured by fine, sharply-cut, concentric striæ, and covered with a thin, dark olive epidermis. Hinge denticles about fifteen anterior and twenty posterior. [J. P. C.]

Length half an inch; breadth one-fifth of an inch; height three-tenths of an inch.

Dredged in Orange Bay, Cape Horn.

It resembles *N. rostrata*, from Massachusetts Bay, but is shorter, thicker, less prolonged posteriorly, and has a strongly-marked lunule, which is wholly wanting in that species. It closely resembles *N. cœlata*, Hinds, from the Northwest Coast, which is anteriorly shorter, more ventricose, and sculptured all over.

Figures 539, 539 *a*, two views of the shell, enlarged; 539 *b*, the hinge; 539 *c*, natural size.

CYCLAS EGREGIA (*Gould*).

T. ventricosa, transversa, oblonga, sub-equilateralis, concentricè tenui-lirata; apicibus parum elevatis, tumidis; epidermide viridi-corneo, fusco-zonato; plerumque C. corneæ similis.

Cyclas egregia, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 292. Nov. 1850. Expedition Shells, 86.

This shell is so similar to *C. cornea* that it would not be distinguished without careful examination. It is, however, larger, more rounded in outline, and more globose in form. The epidermis is less glistening, of a deeper green, and exhibits no traces of radiations. The hinge ligament is shorter and more prominent. As to its beaks, furrowing,

and hinge, it is almost identical. It is larger than any other species I have seen.

Length seven-eighths of an inch; height six-eighths of an inch; breadth half an inch.

Inhabits Hunter's River, New South Wales.

Figures 526, 526 *a*, lateral and dorsal views of the shell; 526 *b*, the hinge.

CYCLAS PATELLA (*Gould*).

T. parva, tenuis, rotundato-ovalis, lenticularis, modicè cavata, concentricè exiliter sulcata, epidermide luteo-viridi induta; apicibus medianis, rotundatis, haud elevatis: intus lactea: cardo dentibus duobus minutis cardinalibus instructus; dentibus lateralibus remotis, validis.

Cyclas patella, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 292. Nov. 1850. Expedition Shells, 86.

SHELL small, thin, lenticular, nearly equilateral, transversely rounded-oval, rendered somewhat triangular by the dorsal slope; somewhat pointed at beaks; surface finely grooved concentrically, and somewhat radiately striate at beaks. Valves regularly convex, scarcely modified by the beaks; epidermis pale greenish-yellow. Interior creamy white, smooth; cavity of the beaks very shallow: hinge with two minute, diverging, cardinal teeth, and a distant, well-developed lateral one on each side.

Length half an inch; height three-eighths of an inch; breadth one-fourth of an inch.

Inhabits Oregon, at Wallawalla and Vancouver.

This is to be compared with *C. cornea*, on account of the peculiar rounded form of the dorsal region, the umbones not rising so as to interfere with the general outline. The cavity of the beaks is still more shallow, the sulcation coarser, and the colour yellowish rather than

green, and on the whole the shell is more dense and larger. One specimen is more elongated than the others, and the dorsal outline is somewhat angular at each extremity.

Figures 527, 527 *a*, lateral and dorsal views of the shell; 527 *b*, the hinge.

CYRENA DEBILIS (*Gould*).

T. parva, tenuis, transversè ovata, posticè ampliata et subtruncata, sub-equilateralis, concentricè liris confertis, sub-reflexis arata; epidermide nitido, supernè olivaceo induta; apicibus parum elevatis, erosis, absque lunulâ: intus violaceo-albida; dentibus cardinalibus inconspicuis; dentibus lateralibus elongatis, striatis.

Cyrena debilis, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 293. Nov. 1850. Expedition Shells, 86.

SHELL small, thin, transversely ovate, pale yellowish-green, darker towards the apex, polished and shining, furrowed with fine, concentric, slightly reflexed ridges. Beaks not very prominent, eroded, nearly central, without an areola in front; anterior side a little narrowed, posterior extremity slightly truncated. Interior violaceous-white. Cardinal teeth minute; lateral teeth elongated, finely pectinate.

Length six-tenths of an inch; height four-tenths of an inch; breadth one-fourth of an inch.

Inhabits New Holland, Upper Hunter River. This locality may possibly be erroneous, from an accidental mixture of specimens.

Most like *C. pusilla*, but has no areola in front of the beaks, and is less orbicular and somewhat larger. It has the aspect of a *Cyclas*. One small specimen is deep violaceous within, with four white radiations.

Figures 529, 529 *a*, lateral and dorsal views of the shell; 529 *b*, the hinge.

UNIO LUTULENTUS (*Gould*).

T. transversa, compressa, sub-falcata, valdè inequilateralis, concentricè undulato-striata interdum nodosa vel sursum rugosa, fusco-virescens; lateribus rotundatis; marginibus sub-parallelis; apicibus prominulis, erosis; dentibus cardinalibus obliquis, compressis, in valvâ dextrâ bifidis; dentibus lateralibus elongatis, compressis, rectis: margarita argentata; limbo anticè incrassato.

Unio lutulentus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 295. Nov. 1850. Expedition Shells, 88.

ANIMAL having the foot slaty white, edge of the mantle and gills orange; siphonal fringes black; abdominal mass bright ochreous-yellow.

SHELL transversely elongated, scarcely falcate, dorsal and ventral margins nearly parallel; posterior dorsal margin a little sloping, ends rounded; anterior half nearly as high as the posterior; valves rather solid, compressed, with a moderate constriction at the ventral margin; beaks at the anterior fourth, scarcely modifying the dorsal outline by their prominence, much eroded; surface having concentric undations along the posterior umbonal ridge; epidermis shining olive-green, pale leaf-green posteriorly, very faintly radiate-striate, and across the disk are some rays of distinct corrugations. Nacre bluish-white, with livid stains near the hinge, and a silvery brilliance posteriorly. Hinge with a single elongated, slightly prominent, obtuse, very oblique cardinal tooth in each valve; lateral teeth slender, sharp, nearly straight, well developed, double in the left valve. The limbus, outside of the pallial impression, is much thickened.

Length two inches; height one inch; width two-fifths of an inch.

Inhabits New Zealand, common. *Drayton*.

Resembles *U. monodon*, and slender specimens of *U. complanatus*. It is not a fragile shell, and the peculiar tubercular waves along its slope, the scattered corrugations on its disk, and its peculiar colour,

are its best diagnostic marks. These are usually concealed by a thick crust of black earth. It is said to come from streams in the vicinity of chalybeate springs. It varies considerably in form.

Figures 542, 542 *a*, 542 *b*, three views of the shell; 542 *c*, the animal.

UNIO PROFUGUS (*Gould*).

T. transversa, elongato-ovalis, ventricosa, epidermide fusco-castaneo, concentricè undato-striato, radiatim obsoletè plicato induta; margine ventrali vix arcuato; margine dorsali sub-recto; latere antico rotundato: latere postico obliquè truncato, ad apicem obtuso; apicibus antemedianis, elevatis, erosis; dentibus cardinalibus obliquis, elongatis, compressis; dentibus lateralibus remotis, sub-arcuatis: margarita livido-albida.

Unio profugus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 295. Expedition Shells, 89.

SHELL solid, transversely sub-oval, sub-equilateral, moderately tumid; anterior end narrowest, elliptically rounded; ventral edge slightly curved; posterior dorsal margin curved about equally with the basal, the downward slope a little oblique, the tip obtuse; beaks two-fifths from the anterior end, considerably elevated, eroded; posterior umbonal slope rather full. Surface rather coarsely undulated by the stages of increment, and with faint, radiating striæ, sometimes amounting to undulations on the disk, which is rather flat; epidermis dark dirty olive, shining, sometimes wrought into radiations of ripple-like curves on the disk. Nacre bluish-white, not brilliant, punctate, with bronzed blotching posteriorly, well thickened at the ventral portion. Hinge well developed; cardinal tooth obliquely transverse, of two unequal lobes in the right valve, single in the left; a deep rounded sinus between the cardinal and the lateral tooth, which is well developed, a little curved, divided a little way at tip: muscular impression well marked.

Length two and three-fourths inches; height an inch and a half; width seven-eighths of an inch.

Inhabits Hunter's River, New South Wales.

Slender varieties have much the appearance of the more expanded forms of *U. lutulentus*. It is more tumid, the beaks more elevated and more central, the entire dorsal margin less direct, the hinge more curved, the cardinal tooth of the right valve more oblique and distinctly bifid, the lateral tooth of the left valve less extensively cleft, and I cannot find that it is ever nodular along the posterior slope. The nacre has a tendency to salmon-colour, and it does not seem to accumulate a dense coating of mud externally. Its exterior is almost precisely like *Anod. areolata*.

Figures 543, 543 *a*, 543 *b*, three views of the shell.

UNIO DORSUOSUS (*Gould*).

T. transversa, retrorsum ampliata, inequilateralis, compressa, castanea; latere antico circulari; latere postico obliquè rotundato; margine dorsali recto; apicibus pro-eminentibus, antrorsum concentricè costato-undulatis, retrorsum nodoso-fluctuatis: dente cardinali perobliquo, elongato, compresso; dente laterali recto: margarita ex albo-cærulescens, livido ad umbones tinctorum.

Unio dorsuosus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 296. Nov. 1850. Expedition Shells, 89.

SHELL transversely oblong-ovate, thin, rather compressed, chestnut-brown; beaks prominent, radiately plicate in front by four or five delicate concentric ribs; nodose-fluctuate along the posterior umbonal slope; remainder of the surface smooth; posterior half one-third broader than the anterior; dorsal margin rectilinear, posteriorly compressed and obliquely rounded at the extremity; anterior tip semi-circular. Cardinal teeth lamellar, delicate, slightly oblique; lateral teeth straight, short, and delicate. Nacre bluish-silvery, opaque white at the posterior ventral region. Cavity of the beaks deep, tinged with rusty greenish. Anterior cicatrix well impressed; posterior cicatrix scarcely perceptible; anterior ventral margin thickened.

Length an inch and a half; height seven-eighths of an inch; breadth half an inch.

This shell was marked Feejee Islands, probably by some accident, as I doubt not, from its characteristics, that it came from Eastern Asia.

It is allied to *U. Murchisonianus*, Lea, but is more widened and rounded posteriorly, is not sinuate at the ventral margin, is thinner and more compressed.

Figures 540, 540 *a*, 540 *b*, three views of the shell.

UNIO VERECUNDUS (*Gould*).

T. tenuis, inequilateralis, transversa, ovato-oblonga, convexiuscula, luteo-olivacea; margine dorsali recto; margine ventrali arcuato; latere antico rotundato; latere postico obliquè rotundato; apicibus prominulis, acutis, undulatis, erosis: cardo exilis; dentibus tenuibus longitudinalibus: margarita exsalmonaceo purpurea.

Unio verecundus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 295. Nov. 1850. Expedition Shells, 89.

SHELL thin and fragile, transversely ovate, dorsal margin straight, slightly ascending; ventral margin very gently curved, nearly parallel with the dorsal; anterior end circularly curved, having the vestige of an angle as it joins the dorsal margin; posterior end without any abrupt angles; tip broadly rounded; margin above it oblique, gently curved; beaks eroded, purplish, about two-fifths distant from the anterior end, slightly elevated, minutely undulated with oblique folds, some of which are zigzag; disk tumid, umbonal slopes obtusely rounded; epidermis thin, pale olive, with a tinge of red, generally smoothly adherent, except posteriorly. Nacre pale peach-blossom, darker posteriorly; hinge very delicate; cardinal tooth single in each valve, elongated, nearly parallel with the margin; lateral tooth linear, delicate, straight, divided in the right valve; muscular impression indistinct; pallial impression less so.

Length an inch and three-fourths; height an inch and an eighth; breadth five-eighths of an inch.

Inhabits Manila.

Much like *U. Bengalensis* and *U. foliaceus*. In the former, both ends of the ventral margin are angular, the posterior side is dilated and angular at tip, and the interior is less bright red. The form of this is rather elliptical than ovate. *U. foliaceus* is smaller, thinner, compressed, and has a plumbeous nacre.

Figures 541, 541 *a*, 541 *b*, three views of the shell; 541 *c*, undulations of the beaks.

UNIO FAMELICUS (*Gould*).

T. parva, tenuis, transversa, oblongo-ovata, convexiuscula, epidermide fusco-castaneo induta; margine dorsali arcuato; margine ventrali rectiusculo; latere antico angusto; latere postico obliquè rotundato; apicibus haud elevatis ad quadrantem anteriorem sitis; dente cardinali obliquo, compresso, valido; dente laterali brevi, recto: margarita subpurpurea.

Unio famelicus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 294. Nov. 1850. Expedition Shells, 88.

SHELL quite small, thin, inequilateral, transversely elongated, somewhat obliquely ovate: dorsal edge ascending, regularly curved, and somewhat more so than the ventral margin, which varies from slightly convex to slightly concave; anterior end circularly rounded: posterior end somewhat declining, obtusely rounded at tip, which is near the ventral margin: beaks at anterior fourth, slightly elevated, much eroded, of a light bronze-green colour; disk convex; umbonal slopes full, not angular; epidermis yellowish-green on posterior slope, dusky on disk: surface rather smooth, the lines of growth fine and regular: some indications of radiating striæ on the disk: nacre pale greenish-white: cardinal tooth very oblique, elevated, compressed, triangular, striated, double in the right valve: a considerable thin, rounded, curved space intervenes before coming to the lateral tooth, which is short, straight, double in the left valve: cavity of the beaks small and shallow: muscular impressions well marked.

Length an inch and a quarter; height three-fourths of an inch; breadth three-eighths of an inch.

Inhabits Wallawalla, Oregon. *Dr. Pickering.*

A small and rather remarkable species, like a miniature *U. complanatus*. It is more equilateral, has no dorsal angles, the dorsal and ventral margins diverge more, and the cardinal teeth are more oblique. It also resembles *U. paludicolus*, from Florida, but is smaller.

Figures 544, 544 *a*, 544 *b*, three views of the shell.

ALASMODONTA FALCATA (*Gould*).

T. transversa, valdè inequilateralis, falcata, anticè rotundata, posticè deflecta, acuta, marginibus subparallelis; disco sub-excavato; umbo-nibus obtusis, erosis; epidermide subfusco; dente cardinali in valvâ dextrâ elevato, trigono, in valvâ sinistrâ longitudinali, compresso-triangulari; margaritâ purpurascente; limbo argenteo.

Alasmodon falcata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 294. Nov. 1850. Expedition Shells, 87.

SHELL large, transversely elongated, inequilateral, falcate, dorsal margin gently curved; basal margin nearly parallel with it: anterior extremity rounded; posterior deflexed, produced, rather acute; disk somewhat excavated: beaks at the anterior fourth, slightly raised, eroded: epidermis dead sooty-black: surface concentrically waved with crowded, but strongly-marked, almost lamellar lines of growth; cardinal tooth, left valve, prominent, laterally compressed, pyramidal; with a very small obsolete tooth in front, separated by a pit: a single oblique pyramidal tooth in the right valve, with a fissure in front and a deep pit behind: nacre pearly at margin, tinted pale copperas or peach-blossom colour near the cavity of the beaks, and clouded with livid: muscular impressions very profound, anterior one distinct: cavity of the beaks considerable.

Length four inches; height one and a half inches; breadth one inch.

Inhabits Wallawalla, Spokane, Wahlamet, &c., Oregon, *J. Drayton*; and Upper Sacramento River, California, *Dr. Pickering*.

Mr. Lea and others have regarded this as a variety of *A. margaritifera*. He says of specimens brought by Mr. Nuttall, "It should be remarked that the nacre in these specimens is always purple, a character not observed from other localities." But besides the uniformly peach-blossom nacre, the form is generally more arcuate, the exterior more waved, the colour darker; the anterior tooth in the right valve is comparatively obsolete, longitudinally oblique and lamellar in the young. The young have also the sides compressed, the epidermis rusty brown, and a great part of the nacre white; the teeth are also more sharply developed. A small, distorted specimen, was short and much inflated. From the large heaps of dead shells observed by Dr. Pickering, both in Oregon and California, it is evidently used extensively for food, by the Indians.

Figures 545, 545 *a*, 545 *b*, three views of the shell.

ANODONTA PUBERULA (*Gould*).

T. transversa, elongato-ovata, ventricosa, anticè rotundata, posticè obliquè rotundata et costâ obliquâ submarginali munita; margine dorsali arcuato; margine ventrali concavo; apicibus ante-medianis, acutis, parum elevatis; epidermide olivaceo-glauescente fluctuatim corrugato induto: cavositas argentea; disco salmonaceo: cardo edentulus vel potius papillâ cardinali in valvâ dextrâ instructus.

Anodon glauca, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 293. Nov. 1850. Expedition Shells, 87.

SHELL transversely elongate, slightly falcate, gradually widening backwards, inequilateral, compressed and even excavated at the sides; posterior umbonal slope full, bounded above by a rib-like elevation, passing from the beaks to the middle of the posterior end; beaks at the anterior third, rather prominent, eroded; anterior end acutely rounded; dorsal and siphonal ends arcuate; ventral margin concavely arcuate. Epidermis pale olive, radiately corrugated in festoons.

Hinge simple, with a very small cardinal papilla on the right valve. Nacre silvery, with livid green cloudings; muscular scars well marked.

Length an inch and five-eighths; height seven-eighths of an inch; breadth half an inch.

Inhabits Peru.

This shell appears to be different from any which I find described. Its peculiar colour, a dead russet green, with the epidermis remarkably corrugated into zigzag loops, may serve to distinguish it. It would come under the genus *Monocondylea* of D'Orbigny. The name first applied is pre-occupied.

Figures 548, 548 *a*, 548 *b*, three views of the shell.

ANODONTA COGNATA (*Gould*).

T. fragilis, transversa, oblongo-ovata; margine dorsali brevi, recto; margine ventrali arcuato; latere antico rotundato; latere postico oblique truncato, ad apicem rotundato; disco turgido; epidermide virescente, nitido; apicibus ante-medianis inconspicuis, undulatis: margarita livido-albida.

Anodon cognata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 294. Nov. 1850. Expedition Shells, 87.

SHELL elongate, transversely ovate, thin and fragile, pale yellowish-green, more yellow in the young, faintly radiated: beaks at the anterior third, inconspicuous, wrinkled: disk turgid: dorsal margin short, rectilinear: basal margin strongly arcuate, especially behind the middle: anterior end narrow, rounded; posteriorly compressed above, with a long oblique slope, somewhat nasute: pale leaden within, clouded with livid. Cavity of the beaks nearly wanting, the valve being almost symmetrically spoon-shaped; impressions very faint.

Length three inches; height one inch and a half; breadth one inch.

Inhabits Nisqually and Vancouver, Oregon. *Dr. Fox.*

Resembles small specimens of *A. cygnea*; but the dorsal margin is

shorter, not continuously straight, and forming an abrupt angle above, anteriorly; the posterior extremity is less acute and more nasute; the cavity of the beaks is also somewhat over-arched. Excepting the beaks, it is like *A. fluviatilis*.

Figures 546, 546 *a*, 546 *b*, three views of the shell.

ANODONTA ANGULATA (LEA). Genus Unio, II., pl. 16, f. 52.

Mr. Lea's figure and description give but a very imperfect idea of this very remarkable shell. In the first place it is very much larger than the valve seen by Mr. Lea,—an inch and seven-tenths by three and a half inches; the umbonal carina is very strongly marked; anterior to this the epidermis is bright leaf-green, smooth, with radiating ranges of short wrinkles; posterior to it, the epidermis is dusky, and laid in loose, foliaceous, concentric folds. The nacre within the pallial impression is of an oily lustre, and deep peach-blossom colour blending with salmon colour.

Found in the Sacramento River, California.

ANODONTA FEMINALIS (*Gould*).

T. solidula, transversa, ovato-triangularis, anticè acuminata, margine postico in margine dorsali desinente, arcuato; margine ventrali recto; apice rectangulari; apicibus inconspicuis, erosis, anticis, declivitate posticali obtusè angulato; epidermide lamelloso, piceo: margarita purpurascens; limbo argenteo; dente cardinali obsoleto.

Anodon feminalis, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 293. Nov. 1850. Expedition Shells, 87.

SHELL rude, rather thin, transversely elongated, triangular-ovate, inequilateral, somewhat falcate; anteriorly narrow, and rapidly widening backwards; dorsal margin arched, regularly curving into the posterior obliquely-curved margin without an angle, and forming a right angle with the ventral margin, which is slightly arcuate convexly; anterior extremity rounded; valves thin and rude, rather ven-

tricose, divided into two areas by a prominent but obtusely angular umbonal slope; the anterior area nearly plane, the posterior convex; beaks inconspicuous at the anterior fifth, much eroded; stages of growth loose and laminated, with some indistinct radiating striæ on the disk; epidermis coarse, piceous. Nacre bluish-white, with salmon stains in the cavity of the beaks; left cardinal margin very delicate, and nearly destitute of a tooth, thickened posteriorly, while the right valve has a conspicuous thickening at the beak, which generally rises into a tubercular, tooth-like apophysis.

Length two and a quarter inches; height an inch and a quarter; width three-quarters of an inch.

Inhabits Wallawalla, Columbia River, Oregon. *Dr. Pickering.*

At first this was supposed to be the young of *A. angulata*, Lea; but it proves different in several constant characters, besides its widely remote habitat. It is much smaller and thinner, its surface rude and dusky, instead of smooth and green; its outlines are all curves instead of right lines; the dorsal and terminal outlines form a continuous curve instead of a distinct angle; the posterior umbonal slope is obtusely angular instead of having the remarkably acute carination of *A. angulata*, and the area posterior to it is convex and not concave; the beaks are more anterior, and the cardinal apophysis is never found in *A. angulata*, while it is constant in this.

Figures 547, 547 *a*, 547 *b*, three views of the shell.

AVICULA MARGARITIFERA (LIN.), ROISSY. *Meleagrina margaritifera*, LAMARCK; Anim. sans Vert., vii. 107.

SHELL rounded-trapezoidal, compressed, attaining great size and weight. Colour sea-green, radiated with whitish stripes; surface in distant loose laminæ, which in young specimens project into from fifteen to twenty series of long, spatulate scales corresponding to the pale stripes. Hinge margin long and straight, the posterior* margin passing off at nearly a right angle without forming a queue, and after passing half the length in a right line, gently curves around the ventral

* The side from which the byssus issues, is considered the anterior.

portion, and forms a shorter curve at the byssal margin; so that the general curve of the whole shell is forwards. Right valve most convex; byssal notch a broad deep groove running to the apex, over which a small auricle with a simple margin partially projects; in the left valve the auricle is still less conspicuous, and there is a large rounded tuberosity answering to the notch in the opposite valve. Nacre faint greenish, its edge smoky, beyond which the cortical substance projects a considerable distance, lurid and dusky green radiated; no conspicuous hinge teeth.

Figure 555, side view of the shell.

The above description is here introduced, because no detailed characters are to be found in any preceding work; and it seems quite necessary as a standard of comparison for other species, several of which have been confounded with this. It differs from others in the absence of well-marked auricles, and in the peculiar manner in which the ventral margin is curved, much after the form of the point of some old-fashioned table-knives. No other species seems to attain to so large a size.

In describing the species of *Avicula* and *Perna*, the form of the nacred interior, which is constant, is to guide us, rather than the exterior form, which is often rendered quite diverse by the cretaceous margin which extends beyond it. In the following descriptions this rule has been observed.

AVICULA NIGRA (*Gould*).

Testa mutica, inequivalvis, ecaudata, edentula, fusca, antrorsum lobata; valva dextra convexiuscula, posticè integer, anticè profundè emarginata; auriculâ triangulari, crenulatâ: valva sinistra convexior, posticè profundè emarginata: margarita ex argenteo cærulescens; limbo lato, fusco.

Avicula nigra, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 309. Nov. 1850. Expedition Shells, 90.

SHELL small, thin dolabriform, slightly antrorsely curved, height and

length about equal, surface somewhat squamous near edge; colour blue-black; valves nearly flat, right one most so; auricle very small triangular; dorsal edge straight, a little produced at tip; posterior edge emarginate near summit, then descending, curves gently forwards; basal edge slightly curved; anterior edge circularly rounded; deeply emarginate below ear; byssus-notch deep, fissure-like, edge crenulate; byssus tubercle very small. Nacre bluish-white; the dark purplish-black substance extending far beyond; no visible teeth.

Length two inches and three-fourths; height two inches; breadth half an inch.

Dredged at Singapore.

More like *A. margaritifera* in form than any other, but is less retuse, destitute of scales, and having its substance a plain purplish-black. It belongs to Lamarck's genus *Meleagrina*, which is now justly regarded as only a subdivision of *Avicula*.

Figure 554, the shell.

AVICULA VIDUA (Gould).

T. parva, tenuis, dolabriformis, vix obliqua, per-inequilateralis, mutica, nitens, ex viridi purpurascens, deinde nigra, albo obscure radiata: valva dextra planulata: valva sinistra convexa, ecaudata: auricula parva, triangularis; fissura parva, superficialis, edentata: margarita ex argenteo violacescens; limbo lato, nigro.

Avicula vidua, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 309. Nov. 1850. Expedition Shells, 89.

SHELL small, thin, fragile, slightly oblique, length and height about equal; surface smooth, purplish-black, with indistinct white radiations; in its early stages grass-green radiated with white; left valve angularly convex; right valve flat; dorsal margin not caudate, but a little emarginate at posterior edge; auricle very small, triangular; re-entering angle very obtuse, notch small and shallow; cardinal edge broad; no perceptible teeth. Nacre bluish-silvery, darker at periphery, nearly semicircular, calcareous edge very broad, black and

glossy; a large callous rib answering to the fissure. Impressions very shallow.

Length an inch and a quarter; height three-fourths of an inch; breadth three-tenths of an inch.

Inhabits the Feejee Islands.

In the early stages the colour is grass-green, then passing through dark purple to coal black. It is remarkable for the perfect flatness of one valve. Its destitution of hinge teeth brings it in Lamarck's genus *Meleagrina*.

Figures 553, 553 *a*, exterior and interior of the shell.

AVICULA LURIDA (*Gould*).

T. squamosa, vix obliqua, ferè ecaudata, solidula, coloribus rosaceis, viridibus et flavidis radiatim fucata: valva dextra posticè vix sinuata, convexa; auricula lata, triangularis; fissura byssica haud profunda: valva sinistra ventricosa, tuberculo magno subcaudali munita, posticè integra: margarita argentea; limbo corticali corneo et nigro marmorato.

Avicula lurida, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 310. Nov. 1850. Expedition Shells, 91.

SHELL small, thin, pendulous, moderately oblique backwards, rather higher than long; surface rather loosely laminated; with series of close-pressed lanceolate scales near margin; reddish horn colour, grass-greenish on disk, with undulating pale radiations becoming inclined to dusky in old shells; valves rather convex, left one most so; highest part far behind the beaks; posterior dorsal edge compressed; posterior margin broadly emarginate near summit; basal edge circularly rounded; dorsal edge oblique forwards; auricle of right valve rather large, higher than broad, moderately striated; notch very small, and shallow triangular; nacre light steel-blue, with violet reflections projecting, cortical substance broadly radiately marbled with fallow white and coal black. Fold answering to byssus-notch very decided,

riblike, ending in a prominent trigonal knob. A minute cardinal tubercle, and a delicate straight lateral lamina bifurcate at tip. Muscular impressions very indistinct.

Length two inches; height two and a quarter inches; breadth seven-eighths of an inch.

Inhabits the Feejee Islands.

A small species coloured much like *A. margaritifera*; but the curve is in an opposite direction, and it is provided with a well-developed auricle, characters which could not be ascribed simply to immaturity.

Figures 550, 550 *a*, outer and inner views of the shell.

AVICULA FUCATA (*Gould*).

T. saccata, retrorsum obliqua, per-inequivalvis, scabra, rosaceo et flavido radiatim picta: auricula prægrandis, elongata; fissurâ byssali profundâ: valva dextra convexiuscula; angulo postico acuto: valva sinistra ventricosa, anticè haud emarginata, acutangularis, plicâ magnâ munita: cardo dentibus conspicuis: margarita argentea, violacescens; limbo corticali cretaceo, croceo et rosaceo radiato.

Avicula fucata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 309. Nov. 1850. Expedition Shells, 90.

SHELL obliquely ovate, left valve tumid, right nearly flat; surface with short loose laminæ, especially behind; colour radiated yellowish and rose-red, shining; dorsal edge produced into a short acute wing, externally forming a right angle, then sweeping backwards; anterior forming an acute angle and sweeping forwards forms the obliquely ovate outline; auricle long triangular, finely and loosely laminated; re-entering angle a right angle, edge sharp and simple. Nacre silvery white, becoming violaceous at edge; calcareous margin pale, radiated red; byssal fold sharp and distinct, marking off a broad smooth area; cardinal tooth of left valve very strongly developed, inflexed; lateral tooth short, delicate, bifurcate in right valve; muscular dots distinct, not impressed.

Length two and a half inches; height two and a quarter inches; breadth three-fourths of an inch.

Inhabits New Zealand.

In form it resembles *A. lurida*; but its smoother surface, difference of coloration both without and within, and its much more elongated auricle, are quite distinctive. The young stages of this shell are exceedingly beautiful, being rose-red, with a sort of superficial radiation of cream-colour.

Figures 551, 551 *a*, two views of the shell.

AVICULA GLABRA (*Gould*).

T. tenuis, semi-elliptica, vix obliqua, valdè caudata, glabra, ad peripheriam lamellata, virescens, albo-radiata: valva dextra planiuscula; auricula latior quam longa: valva sinistra ventricosa, anticè integra, acutangula: cardinis dentibus obsoletis: margarita argentea; limbo corticali livido-corneo.

Avicula glabra, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 310. Dec. 1850. Expedition Shells, 91.

SHELL very thin and fragile, spade-shaped, slightly oblique; left valve rather ventricose; right nearly flat; surface generally smooth and shining; somewhat loosely laminated near margin, and with ranges of distant minute scales, in young specimens; colour pale beryl-greenish, with opaque white radiations; dorsal edge long and straight, slightly produced into a queue, from which the posterior edge, after a slight inflection, descends directly at right angles; base broadly rounded; anterior edge a little oblique; ear triangular, closely and loosely striated; re-entering angle obtuse; nacre silvery white; shelly margin pale greenish or ochreous; no perceptible cardinal tubercle, and with a short lateral ridge simulating a tooth; byssal edge largely open; opposing tubercle slight, almost without umbonal ridge.

Length and height two and three-fourths inches; breadth seven-eighths of an inch.

Inhabits New Zealand.

Outline much as in *A. fucata*, but the caudal region is much more compressed. Its smooth surface and widely different coloration are easily recognised. The white radiations are opaque, and have a superficial appearance.

Figures 552, 552 *a*, outer and inner surfaces of the shell; 552 *b*, dorsal view.

AVICULA PICA (*Gould*).

Testa solidula, ventricosa, per-inequilateralis, obliquè rotundata, ecaudata; margine caudali parum producto; extus calcarea, nigro radiata: auricula triangularis, crenulata; fissurâ profundâ: margarita pallidè aurea; limbo calcareo lato, vitreo, albo et nigro radiato: margo cardinalis latus, incrassatus; dente cardinali papilliformi; dente laterali brevi, anticè incrassato et deflecto, in valvâ sinistrâ bifurcato; cicatrice musculari reniformi, profundo.

Avicula maculata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 309. Dec. 1850. Expedition Shells, 90.

SHELL small, solid, height and length about equal, a little oblique, broadly rounded; surface chalky white radiate with dusky purple; rather convex, left valve most so; superior margin short, thick; posterior dorsal edge compressed, not produced; posterior margin a little sinuate; surface finely laminated, not produced into scales; auricle rather large triangular, as broad as long; margin conspicuously crenulated; byssal notch deep; nacre pale golden-yellow; shelly margin broad, variegated blue-black and porcelain-white; a minute cardinal tubercle; hinge margin broad and thick, with a short lateral tooth, enlarged and curved downwards at the end; bifurcated in the left valve; a conspicuous range of muscular dots traversing down from the beaks; byssal tuberosity of left valve broad triangular.

Length and height an inch and three-fourths; width five-eighths of an inch.

Inhabits Tutuilla, Samoa Islands.

The peculiar magnesian external coating, radiated with dark purple, the golden nacre, and the porcelain-like marbled limbus, make this a strongly marked species. The name first given is preoccupied.

Figures 549, 549 *a*, exterior and interior of the shell; 549 *b*, dorsal view.

PERNA ARGILLACEA (*Gould*).

T. solidula, mutica, compressa, elongata, anticè dilatata, posticè subrecta, ex luteo alutacea, hic illic nigricans; apice adunco: fissura byssalis, angusta, lanceolata: intus livescens: area cardinalis curta, oblique triangularis, sulcis obliquis ad octo arata: fovea apicalis profunda.

Perna argillacea, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 311. Dec. 1850. Expedition Shells, 91.

SHELL solid, smooth, compressed; pale drab-colour, clouded with dusky, especially at periphery; elongated, somewhat triangular, truncated at tip; surface laminated, and somewhat squamate; hinge short, a little oblique; posterior margin a little concave: anterior a little concave at the byssal fissure, then dilating, becomes continuous with the slightly rounded base. Nacre drab marbled with livid, thin: calcareous limbus broad, very thin, of nearly the same colour: outline of nacre angular: hinge area triangular, grooves eight or ten, long: byssus-opening formed by an inflection mostly in the right valve: apical pit deep.

Length two and a half inches; height three inches; width three-eighths of an inch.

Habitat uncertain.

The resemblance to the common *P. ephippium* of the West Indies is very great. It differs chiefly in the clay-coloured exterior, and in having the byssal instead of the opposite side dilated; the muscular scar is also smaller.

Figure 559, outside of the shell; 559 *a*, inside of the shell.

PERNA TORVA (Gould).

T. rudis, crassa, inequivalvis, concentricè lamellata, cinerea, obliqua, trapezoidea; latere byssali dilatato, semicirculari; sinu byssali profundo; apice adunco; latere postico rectilineari, obliquo, producto; margine cardinali obliquo: area cardinalis triangularis, sulcis obliquis ad sex arata: margarita ex argenteo-purpurascens; limbo lato, retrò dilatato.

Perna torva, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 311. Nov. 1850. Expedition Shells, 92.

SHELL rude, rather solid, elongated, somewhat trapezoidal, oblique: posterior margin oblique, nearly straight: anterior base abruptly rounded: posterior edge and base broadly rounded: colour pale drab: hinge margin short, oblique, widening anteriorly: teeth, about six, slender. Nacre silvery white: calcareous limbus broad, especially behind: ground-colour of the exterior ashy, but clouded dusky: nacreous portion scarcely oblique: byssus fissure small, intruding but little into the shell, nearly equal in both valves: beaks acute.

Length an inch and a half; height an inch and three-fourths; breadth three-eighths of an inch.

Inhabits the Sandwich Islands.

The obliquity of this species, and the small number of its cardinal sulci, are among its most prominent characters.

Figures 558, 558 *a*, outside and inside of the shell.

PERNA NANA (Gould).

T. parva, crassa, subquadrata, adunca, lamellosa, extus nigra; margine ventrali sinuato; angulo infero-posteriori rotundato; latere postico sinuato: area cardinalis lata, 6-sulcata: fissura byssalis ampla, triangularis: margarita plumbaginea; limbo corticali angusto, pallido.

Perna nana, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 312. Nov. 1850. Expedition Shells, 92.

SHELL small, solid, elongated, rounded posteriorly and at base, concave anteriorly, adunque at tip: surface generally smooth and shining, squamous towards edge, coal black. Interior slaty black, or black-lead colour, silvery under beaks, darker towards periphery: hinge area very thick: teeth, about six: byssus aperture formed by a broad inflexure of the anterior margin: calcareous edge narrow and pale: muscular impressions deeply marked.

Length three-fifths of an inch; height three-fourths of an inch; breadth one-fourth of an inch.

Inhabits the Feejee Islands, under stones. *Drayton*.

The solidity and colour of this little species will not admit of its being confounded with any other species. It bears the marks of mature age.

Figures 556, 556 *a*, inside and outside of the shell.

PERNA EREMITA (*Gould*).

T. fragilis, exaluminata, variabilis, dolabrata, vulsellata, unguiformis, pectiniformis et omnimodè distorta, plerumque radiatim rugoso-striata et in junioribus rufo-lineata; antrorsum plus minusve arcuata: margarita argentea; limbo corticali ampliato, foliaceo, stramineo, vitreo: margine cardinali ferè horizontali, sex ad octo sulcato; fissurâ byssali profundâ.

Perna eremita, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 311. Nov. 1850. Expedition Shells, 92.

SHELL small, thin, fragile, very irregular, conforming itself to its places of abode: normal form pectiniform, subcircular, with a short, straight, dorsal margin, but sometimes much elongated, like *Malleus*. Colour pale greenish horn-colour, near the beaks radiated with beryl-green. Young specimens, which have been protected from injuries,

are sculptured by radiating ramose ribs, bearing minute, pointed scales. Almost every shell, if closely examined, especially near the beaks, will exhibit some of these corrugations; but others become for the most part smooth, lamellar and shining. Left valve emarginate near beak, leaving the upper point adunque; right valve flat, with a large semicircular byssus-fissure. Interior silvery white, with a very broad drab-white limbus: byssus-fissure a shallow sinus in right valve: opposed by a large, prominent, re-entering sinuous callosity: ligament grooves six or eight, delicate, short.

Length two inches; height an inch and four-fifths; breadth three-eighths of an inch.

Inhabits Carlshoff Island, Paumotu Group.

This shell, though so variable as to elude all terms of description, is still very distinct from all others, in all its forms. It seems to acquire its multiform shapes from the cavities in coral where it resides. Young or well-protected specimens are sculptured by delicate, radiating, ramose ribs, bearing minute scales.

Figures 557, 557 *a*, outside and inside of the shell; 557 *b*, an elongated form; 557 *c*, a young specimen.

CRENATULA PERGAMINEA (*Gould*).

T. membranacea, obliquissima, subfalcata, concentricè laminoso-fibrosa, albida, lineis lacteis radiata; margine dorsali recto, apicibus tumidis, acutis, ad trientem anteriorem sitis; latere antico arcuato et cum margine ventrali continuo; latere postico obliquè truncato: area cardinalis angusta ad quinque crenata: intus submargaritacea.

Crenatula pergaminea, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 310. Nov. 1850. Expedition Shells, 91.

SHELL thin, light, parchment-like, pale, pearly white, with fine radiating lines of milk-white, transverse, turning very obliquely backward in a foliate manner; hinge margin straight, the beaks, at the anterior third, acute, and the umbonal slope protuberant; posteriorly

somewhat alate, compressed, the margin obliquely and somewhat concavely truncate, somewhat nasutely terminated: the anterior and basal margins forming a continuous curve. The ligament margin is delicate and narrow, furnished with about five notches. Interior somewhat silvery.

Length an inch and a quarter; height five-eighths of an inch; breadth three-eighths of an inch.

Inhabits the Feejee Islands.

None of the species already described agree with this in colour, texture, or form. Its structure is very delicate and unresisting, almost fibrous at its edge.

Figures 584, 584 *a*, lateral and dorsal views of the shell; 584 *b*, the hinge.

PINNA SENTICOSA (*Gould*).

T. cuneata, subinflata, posticè obliquè rotundata, purpureo-nigricans; margine dorsali subascendente; margine ventrali propè apicem pendulo: area superior triangularis costulis ad septem radiantibus squamigeris (squamis semi-tubulosis) instructa; area inferior striis incrementalibus solum notata.

Pinna senticosa, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 312. Nov. 1850. Expedition Shells, 92.

SHELL wedge-shaped, somewhat inflated, rather firm, of a dusky colour, inclined to purple, especially near the apex. The dorsal margin is slightly ascending, ventral margin suddenly pendent, about an inch from the apex; posterior margin slightly oblique, obtusely rounded. Above a line running from the apex to the inferior posterior angle, the surface is occupied by about seven small, diverging ribs, bearing rather distant vaulted scales, which become semi-tubular near the end, with also some raised lines in the intervening spaces; the lower portion is plain, except that it is rather deeply marked by the lines of growth.

Length four and a half inches; height two and a half inches; breadth one inch.

Inhabits New Zealand.

Its general appearance is that of *P. seminuda*; but it is smaller, much darker, the ventral margin is less arcuated, and the scales much less numerous and regular.

Figure 574, the shell.

MYTILUS DIVARICATUS (*Gould*).

T. ovato-triangularis, arcuata, præter regionem byssicalem undique radiatim costato-sulcata, sulcis profundis, remotis, interdum divaricantibus; apice peracuto, angulato; margine dorsali haud angulato, portione ligamentali arcuato; margine ventrali recto; epidermide luteo-corneo posticè fuscescens: intus albida, posticè livescens.

Mytilus divaricatus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 344. Dec. 1850. Expedition Shells, 94.

SHELL of medium size, rather solid, somewhat arcuately ovate-triangular; the apex very acute, divided by a sharp umbonal angle; dorsal edge curved throughout, so as to exhibit but the vestige of an angle; ventral margin direct or slightly convex; ventral edge lozenge-shaped, or somewhat tectiform. Surface, except the byssal region, deeply grooved radiately, the grooves often subdividing, forming prominent rounded ribs, diminishing ventrally. Colour yellowish, becoming dusky posteriorly. Interior whitish, or stained livid towards the dorsum.

Length nearly two inches; height about one inch; breadth three-fourths of an inch.

Inhabits the China Seas.

In general aspect it is like *M. Magellanicus*, but is more angular, the grooves are deeper, more numerous and more generally distributed.

They are disposed as in *M. hamatus*, but are much larger, as in *M. demissus*. Another species, probably from New Holland, is grooved much like it, but is larger, and differs in its form.

Figures 565, 565 *a*, lateral and dorsal views of the shell.

MYTILUS ALGOSUS (*Gould*).

T. transversa, subcylindrica, elliptico-triangularis, valdè corrosa, epidermide tenui, intensè smaragdino induta; margine dorsali angulato, posticè ad marginem ventralem rectum parallelo; latere postico rotundato; fastigio umbonali tumido, obtuso; cardine edentulo: intus punicea.

Mytilus algosus, GOULD; Proceed. Boston Soc. Nat. Hist., iii., 344 Dec. 1850. Expedition Shells, 94.

SHELL elongated, spatulate; upper half triangular, lower semi-oval; dorsal margin obscurely angular, ventral margin nearly straight; fissure for byssus very small; valves semi-cylindrical; apex on a level with the base; surface generally eroded; marginal portion covered with a smooth, shining, thick, invisible-green epidermis; rather compressed at tip; hinge toothless; interior clouded slaty and claret-red.

Length an inch and three-fourths; height and width five-eighths of an inch.

Inhabits the Feejee Islands.

The slender cylindrical form, very dark green epidermis, and interior coloration, are good diagnostic characters.

Figure 566, lateral view of the shell, exterior and interior; 566 *a*, dorsal view.

MYTILUS TROSSULUS (*Gould*).

T. parva, elongata, sub-arcuata, nitida, coracina, subtus cærulea; umbo-

nibus remotis excurvatis, 5-denticulatis; marginibus sub-parallelis; margine ligamentali adscendente, recto, angulato; fastigio umbonali tumido, obtuso; intus crenato, limbo atro; cicatrice palleali lineari.

Mytilus trossulus, GOULD; Proceed Boston Soc. Nat. Hist., iii. 344. Dec 1850. Expedition Shells, 94.

SHELL small, glossy, crow-black, elongated, narrow, marked only with fine undulations of growth: ventral margin direct: dorsal margin obtusely angular at the middle, the posterior portion declining a little towards the base: end rounded, forming a very small, triangular dorsal wing; umbones tumid: basal aspect a little flattened: interior chalky, bluish-white; margin inky black: muscular impression narrow, and separated from the limbus by a mere thread throughout: hinge denticles, about five: beaks sharp, on a level with the base.

Length an inch and a quarter; height an inch and three-fifths; breadth half an inch.

Inhabits Killimook, Puget Sound, Oregon.

Differs from *M. edulis* in its more elongated and more cylindrical form: the dorsal wing is less elevated, its posterior slope rectilinear, and not curved: colour more glossy black, and without radiating striæ; and interiorly it has a threadlike separation of the muscular impression from the dorsal limbus, instead of a rapidly widening one as in *M. edulis*. It is barely possible to be the same. It accords pretty well with the figure given by Middendorff as *M. edulis* (Beitrage, &c., pl. xiv., f. 7, 8).

Figure 567, lateral view of the shell, exterior and interior; 567 a, dorsal view.

MYTILUS PYRIFORMIS (*Gould*).

T. solida, elongata, ovato-trigona, ventricosa, rosacea, epidermide piceo induta; margine ventrali inflecto, radiatim sulcato; fastigio umbonali tumido, concentricè undulato-striato: intus livescens; cardine edentulo.

Mytilus pyriformis, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 344. Dec. 1850. Expedition Shells, 94.

SHELL large, solid, transversely ovate triangular: anterior portion acutangular, dorsal margin very slightly arcuated very near beaks, at its posterior third a little angular: posterior end rather shortly rounded: ventral margin gently convex throughout: surface faintly grooved radiately, the grooves quite conspicuous on the umbonal ridge, which runs quite low down, is very tumid and obtuse, making the ventral portion much more full than the dorsal: the concentric grooves of growth are coarse and undulating: colour of shell faintly rose red: epidermis very thick, fragile, pitchy black: interior livid white.

Length three and a half inches; height one inch and three-fourths; width an inch and a half.

Inhabits the South Seas.

One of the peculiarities of this shell is the similarity of the curve of the dorsal and ventral margins, giving it, when viewed internally, an elongated egg-shape. Its inflated ventral portion, and its striation and coloration, are also marks easily recognised; its lateral diameter is unusually great.

Figures 564, 564 *a*, lateral and dorsal views of the shell.

MYTILUS (Modiola) AREOLATUS.

Testa transversa, ovato-elongata, incurvata, tumida; apicibus approximatis, angulatis, ferè terminalibus; margine dorsali arcuato; margine ventrali fornicato, valdè hiante; epidermide nitido, castaneo, portione antico-ventrali sulco limitato: intus alba, limbo dorsali purpurascete.

Mytilus (Modiola) *areolatus*, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 343. Dec. 1850. Expedition Shells, 93.

SHELL rather solid, transversely ovate, umbonal end pointed and decurved; beaks very near the tip, tumid, obtusely angular; dorsal

edge rectilinear, about half its length, then gradually curving; tip broadly rounded; ventral margin concave near the beaks, where there is a large fissure for the byssus; a constriction, running from the beaks to the end of the fissure, marks off a triangular segment of a darker colour; epidermis thick, varnished, of a deep chestnut-brown, paler along the umbonal ridge, marked by undulations of increment, and indented with numerous short, arrow-headed, radiating undulations: interior cream-colour, livid around the ligament, the dorsal portion flesh-coloured.

Diameters: longitudinal, two inches; vertical, an inch and a quarter; transverse, one inch.

Inhabits New Zealand.

Somewhat like *M. vulgaris*; the beaks are nearly terminal, the byssal opening broader and nearer the beaks, the ventral margin arching inwards instead of outwards at this point; the epidermis is darker and more shining, and the nacre is different.

Figures 562, 562 *a*, lateral and dorsal views of the shell.

MYTILUS (Modiola) FLABELLATUS (*Gould*).

T. transversa, elongata, trapezoidea, trifariam cuneata; apicibus minimè terminalibus, acutis, attigentibus; declivitate umbonali ventricosò, angulato; marginibus rectilinearibus; latere postico obliquè truncato, haud angulato; epidermide anticè nitido, exusto, posticè flavo-viridi, flosculis rigido: intus exalbida.

Mytilus (Modiola) *flabellatus*, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 343. Dec. 1850. Expedition Shells, 343.

SHELL large, thin, elongated, trapezoidal, dilated posteriorly; beaks elevated, pyramidal, contiguous, acute, placed at the anterior seventh; umbonal ridge elevated, angular above, widening and becoming more rounded backwards; portion anterior to the slope trigonal, wedge-shaped in three directions; extremity narrow, rounding upwards; dorsal and ventral margins diverging, rectilinear for three-fourths of

length, when the upper margin rounds downwards; posterior extremity broadly rounded; epidermis glossy, first triangular third of a scorched, dark chestnut-brown or tar-colour, palest at extremity; posterior third pale yellowish horn-colour; behind the umbonal ridge rigid with a coating of the loose fringe-like terminations of the layers of growth; interior pearly white; slightly gaping in front.

Diameters: longitudinal, four inches; vertical, an inch and three-quarters; transverse, an inch and a quarter.

Inhabits Oregon; Puget Sound, Townsend Harbour, California.

A very well-marked species, more than usually cuneate, and with the beaks quite remote from the summit.

An old specimen from San Francisco is much more elongate, falcate, not dilated vertically so much. A young specimen from the Gulf of California is almost lanceolate posteriorly, and compressed laterally. All agree in the anterior extremity, in tissue, colour, &c.

Figures 561, 561 *a*, lateral and dorsal views of the shell.

MYTILUS (Modiola) HEPATICUS (*Gould*).

T. parva, elongata, ovato-triangularis, anticè angustata, ventricosa; margine dorsali angulato; apicibus acutis, angulatis; epidermide tenui, livido-corneo, versus fastigium umbonalem flavescente: intus punicea, luteo-marginata.

Mytilus (Modiola) *hepaticus*, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 343. Dec. 1850. Expedition Shells, 93.

SHELL small, elongated oval, dorsal edge angular at the middle, upper portion rectilinear; lower slightly curved, nearly parallel with the base, narrow and rounded at tip; beaks acute, near the end; umbonal slope angular; dorsal portion compressed; ventral margin incurved at centre, to which a slight radiating constriction of the valves is directed; byssal opening very narrow; epidermis bluish-green, glaucous on the disk, chestnut on the belly, loosely laminated and produced

into fine filiform appendages. Interior deep claret-red, even blackish in old specimens; edge yellowish.

Length an inch and a quarter; height three-fourths of an inch; breadth five-eighths of an inch.

Inhabits the Feejee Islands.

A small, elongated species, with its dorsal edge obtusely angular, but best distinguished by its peculiar lurid exterior colouring, and its reddish molybdæna-coloured interior. Young shells have a straw-coloured disk.

Figure 563, side of the shell, exterior and interior; 563 *a*, dorsal view.

MYTILUS (Modiolarca) PUSILLUS (Gould).

T. parva, transversa, subcylindrica, ovalis, solida, concentricè striata; marginibus subparallelis; latere antico truncato, angulo ventrali obtuso; latere postico latè rotundato; apicibus tumidis, subterminalibus, contortis; colore cinereo, vel rubro-tincto.

Mytilus (Modiolarca) *pusillus*, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 345. Dec. 1850. Expedition Shells, 59.

SHELL minute, thick and solid, transversely oval, beaks nearly terminal, elevated and tumid, somewhat excurved, like *Isocardia*; the whole shell inflated, subcylindrical; dorsal and basal margins nearly parallel; posterior end broadly rounded; anterior end vertical; basal angle obtuse; surface concentrically striate; epidermis very delicate, colour pale cinereous, sometimes tinted reddish; interior clouded brown, and an intense red-brown; hinge margin intense blood-red; a single, obsolete, apical, oblique, coaptate tooth in each valve, continued posteriorly, so as, with the posterior edge, to form a ledge for the ligament simulating sometimes an elongated lateral tooth; the apical tooth sometimes bifid.

Length one-fifth of an inch; height one-eighth of an inch.

Inhabits Tierra del Fuego.

This curious little shell is interesting from its being a representative, from the southern seas, of a form not uncommon in northern waters.

Figures 585, 585 *a*, 585 *b*, lateral, dorsal, and hinge views of the shell, enlarged; 585 *c*, natural size.

PECTEN LÆTUS (*Gould*).

T. ovato-triangularis, ventricosa, equivalvis, dilutè rosea albo quinque ad sex-radiata: margine ligamentali obliquo, auriculis valdè inequalibus, obliquis; auriculâ byssicâ profundè fossato-emarginatâ, radiatim sulcato-costatâ, costis numerosis inequalibus argutè muriculatâ: intus albido-incarnata.

Pecten lætus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 345. Dec. 1850. Expedition Shells, 95.

SHELL rather small and thin, nearly equivalve, longer than broad, ventricose, pale rosaceous, with three or four pale rays: hinge margin oblique; auricles very unequal, and very strongly defined by the abrupt or even channeled border of the body of the shell; short ear quite small, oblique, forming an obtuse angle; byssal auricle large, oblique, nearly equilateral, forming an acute angle; byssal fissure very large, quadrilateral, denticulate, isolated by a deep, broad, smooth groove from the apex, leaving a long, tomahawk-shaped, nearly isolated, radiately grooved auricle. On the opposite valve, against the notch, is a prominent tubercle by an inflection of the margin. Surface everywhere furrowed with radiating grooves, forming numerous unequal rib striæ, rigid with fine, muricate scales; the two valves sculptured nearly alike, the pale one a little the finest. Interior white, tinted flesh-colour.

Length an inch and four-fifths; height three-eighths of an inch; breadth an inch and three-fourths.

Inhabits New Zealand.

The same type as *P. islandicus*; but is small, more convex, the sculpture rather coarser. The groove between the auricle and body of the shell, which forms the byssal fissure, is remarkable for depth, so that the notch seems to be an emargination produced by the depth of the groove. It is also allied to *P. rubidus*, Hinds.

Figure 571, exterior and interior lateral views of the shell; 571 *a*, lateral view of the shell; 571 *b*, details of sculpture.

PECTEN HERICIUS (*Gould*).

T. rotundato-triangularis, equilateralis, equivalvis; valvis convexis, sub-tumidis: valva superior rosea, lineis exilibus concentricis exasperata, et costis ad viginti-quatuor, angulatis, alternis majoribus et spinis erectis fornicatis insculpta: valva inferior pallidior colore saturatiori zonata, costis subequalibus spiniferis armata; natibus acutis, prominentibus; auribus obliquis valdè inequalibus radiatim squamoso-striatis: intus porcellana; marginibus crenulatis, rosaceis.

Pecten hericius, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 345. Dec. 1850. Expedition Shells, 95.

SHELL triangular ovate, longer than broad, equilateral or a little oblique and equivalve: valves rather full, especially near beaks, whose sides rise abruptly from the ears: colour rose-red, paler and zoned with deeper red beneath; everywhere covered with fine radiating lines, which are rendered rough by erect and arched spines. There are about twenty-four radiating ribs. On the upper side these are alternately large and small, the larger ones crowned along the ridge by a line of long, erect, hollow spines; on the lower valve the ribs are nearly equal, the striæ are coarser, and all the ribs are armed with a row of spines, though not so long as those on the upper valve. Ears oblique, very unequal, rayed with coarse, squamous striæ. Interior porcelain-white, roseate at the edge, where it is finely crenulate.

Length four and a half inches; height an inch and a quarter; breadth four and three-fourths inches.

Inhabits the Straits of De Fuca, Oregon.

A very beautiful species, much like *P. pallium* beneath, but remarkable for the distant ranges of elevated spines on the alternate ribs, the intervening ones being quite depressed, and with merely fine squamous striæ, like the rest of the surface.

Figures 570, 570 *a*, the two sides of the shell; 570 *b*, edge of the shell; 570 *c*, details of sculpture.

PECTEN CAURINUS (*Gould*).

T. trigono-orbicularis, haud crassa, inequivalvis, sub-equilateralis; valva superior convexiuscula, rubra, striis concentricis tenuibus insculpta, costis humilibus rotundatis vel interdum sub-duplicatis ad viginti ornatis: valva inferior convexa, alba, versus marginem rubricans, radiis ad viginti-duo elevatis, quadratis, longitrorsum striatis; nati-bus rosaceis compressis; auribus transversis, sub-equalibus, radiatim striatis: intus lactea, limbo rosaceo.

Pecten caurinus, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 345. Dec. 1850. Expedition Shells, 95.

SHELL large, rather thick, nearly circular, a little inequilateral, and slightly oblique; the valves unequal; the upper valve is purplish-red, slightly convex, marked with delicate lines of growth, and with twenty or more slightly raised, rounded ribs, about half as wide as the interspaces, diminishing towards the sides, and sometimes nearly subdivided by one or more furrows; the lower valve more convex, white, and becoming reddish towards margins, and with about twenty-two ribs, equal to the interspaces, elevated, flattened at summit, and with the sides vertical, and even incumbent; sometimes there are obsolete intervening ones. The ears are transverse, nearly equal, the anterior ones faintly rayed with scattered liræ; the sinus broadly rounded; beaks roseate, compressed; interior milk-white, with a silky lustre, and roseate marginal limb.

Length two and three-fourths inches; breadth two and a quarter inches; height one inch.

Obtained at Port Townsend, Admiralty Inlet, Oregon.

Of the size and aspect of *P. maximus* and *Magellanicus*. The lower valve has the ribs like *P. Jacobæus*, only they are not furrowed.

Figures 569, 569 *a*, the two sides of the shell; 569 *b*, edge view of the shell.

GAIMARDIA TRAPESINA (*Gould*).

MODIOLA TRAPESINA (LAMARCK), Anim. sans Vert., vii. 24. DELESSERT; Recueil, pl. 13, f. 7.

ANIMAL with the mantle closed, except a small aperture at its anterior third, for the passage of the foot, a circular siphonal opening posteriorly, destitute of fringes, and a small excretory orifice just above and behind the posterior adductor muscle. Edges of the mantle yellow, destitute of any fringes or lobes. Branchiæ ample, the outer pair two-thirds the size of the inner, which cover nearly the whole space beneath the mantle, rounded at their free anterior end, and narrowing backwards; attached along the middle of the abdominal mass through their entire length. Mouth rather large, some distance above the base of the foot, with a short, compressed, labial appendage on each side. Foot linguiform, and capable of great extension, with a groove on the outer or ventral side; at its base are two convex lobes, which are emarginate on the posterior side; between, and at the junction of these lobes, at the emarginate part, is a conspicuous orifice, from whence proceeds the byssus, and which leads to a cavity occupying all the posterior portion of the foot, seeming to communicate with the visceral mass, by a small posterior puncture. Stomach large, extending across the liver; intestinal canal not traced, but the rectum appeared to traverse the heart, and to terminate just behind it; the heart itself is attenuated at both ends. Striæ on the branchiæ very apparent. Liver chocolate-coloured, reticulated by numerous white fibres, divided into four lobes, two anterior and superior ones, separated by a deep longitudinal fissure, and two lateral and larger ones of an oval form; behind these, of a creamy colour and consistence, are the ovaries, constituting two-thirds of the whole abdominal mass. The two adductor muscles are large for the shell.

The animal moves with considerable rapidity, as follows: the foot is doubled, so that its point is brought to its base; it is then extended

to great length, carrying a byssal thread, and attaching it to the object towards which it is moving; by a sudden contraction, the shell is jerked forwards the length of the thread; and this operation is repeated until the desired spot is reached, when it is there anchored by a number of threads thrown out in various directions. These threads are very elastic, and are found to proceed from the cavity at the base of the foot.

On some specimens the branchiæ were found to have the intervals of the striæ filled with minute, but perfectly formed shells, those nearest the margin being dark-brown, while those towards the dorsum were paler and nearly white. [J. P. C.]

It will be perceived that the animal of this shell varies from that of *Mytilus*, in having the mantle *closed*, except at three orifices. On the other hand, their interior structure, and especially the apparatus and manner of locomotion, correspond precisely. As the animal differs from that of *Mytilus* in characters which are considered of generic value, it is proposed to give the name of *GAIMARDIA*, after M. Gaimard, who, in all probability, was the first to observe it as an object of scientific interest, and who has also done so much else for science.

Figure 568, lateral view of the shell and animal; 568 *a*, dorsal view in outline; 568 *b*, ventral margin, showing the opening of the mouth; 568 *c*, the gills; 568 *d*, the viscera; 568 *e*, two views of the foot; 568 *f*, mouth and palpi.

SHELL ovate-trapezoidal, thin and fragile, ventricose, covered by a smooth, shining epidermis, of a pale olive-colour usually, but occasionally bright yellow, orange, dark brown, and almost black; beaks near the anterior end, prominent, antrorse, contiguous; anterior end compressed, sloping abruptly to the base; dorsal margin nearly rectilinear; posterior margin regularly rounded; ventral margin somewhat sinuous and gaping anteriorly, forming a small elliptical passage for the foot and byssus; the right valve has two small, oblique, cardinal teeth, which receive two corresponding ones of the opposite valve; muscular impressions quite distinct, united by a somewhat sigmoid pallial impression. Substance of the shell purplish or chestnut-coloured externally; yellowish towards the margin; interior always deep purple within the pallial impression, and rosy white outside of it.

Length seven-tenths of an inch ; height nine-twentieths of an inch ; breadth one-fourth of an inch.

Found in latitude $47^{\circ} 30'$ S., long. $59^{\circ} 50'$ W., adhering to the giant fucus seen floating in these regions, and abounds on kelp in Orange Harbour, where some were found an inch and a half in length.

This seems clearly to be the shell described by Lamarck without a locality, and figured by Delessert ; but as it is a curious shell, and no full description of it is to be found, it is given here. It would seem to be the same species alluded to in the "Voyage of the Astrolabe," (Zool. iii. 216), as "a *Modiola* rare and perhaps new, which attaches itself to the fucus, a short distance at sea," near the Falkland Islands.

OSTREA GLOMERATA (*Gould*).

T. crescentica, lata, sinistrorsum arcuata, solidiuscula, planulata, scabriuscula, laminis dentatis propè marginem foliata, nigricans et alboradiata ; margine undulato : interior alba ; foveâ apicali profundâ ; cicatrice nigricante ; marginibus aut simplicibus aut lineolatis et propè cardinem granulatis ; limbo corticali purpureo et viridi variegato.

Ostrea glomerata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 346. Dec. 1850. Expedition Shells, 96.

SHELL orbicular crescentic, turning to the left, right side convex, left concave, of moderate size and thickness, and shallow cavity. Margin of shell undulated or plicate, the outer shell-substance extending, in a variegated green and slate-coloured margin, beyond the inner nacreous portion ; edge simple, or minutely lineated in a radiate manner ; the upper valve is furnished with a few irregularly disposed granules near the hinge, on each side, with corresponding pits in the lower valve ; hinge area broad, furrowed. Colour of interior white, with a slaty tint to muscular cicatrix, and some olive maculations on the margin of upper valve. Exterior of upper valve tolerably smooth, with dentiform foliations near the margin, like *Meleagrina*. Colour slaty black, with a few, well-defined white radiations.

Diameters about two inches.

Inhabits New Zealand.

It is impossible to declare that this shell has not been already described. It is difficult in this protean genus, to identify species even from good figures. As no figure yet published represents this species, and no description of any shell from the same locality answers to it, a representation and description are here given. *O. denticulata*, and *O. spathulata*, are most nearly allied to it. The excavated lower valve, with its deep umbonal pit, and its dark, slaty, frilled margin, and the opercular upper valve, with a few denticles near the hinge, are among its characteristic features.

Figure 577, a group of shells; 577 *a*, interior, and 577 *b*, exterior of a single specimen.

OSTREA CIRCUMSUTA (*Gould*).

T. solida, elongata, ovata, cinerea, inequivalvis, marginibus undulatis: valva superior denticulis radiantibus marginalibus in foveis sub-marginalibus valvæ inferioris aptantibus: area cardinalis triangularis, contorta, longitrorsum fossata: interior alba, limbo violacescente.

Ostrea circumсата, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 346. Dec. 1850. Expedition Shells, 96.

SHELL small, elongated, narrow-ovate when growing freely, solid, ashy white, or sometimes with bronzed patches; structure dense; hinge area spirally curving to the right, broad, triangular, with a central channel in the lower valve; upper valve much smaller than the lower; at their point of contact is a series of radiating denticles around the whole margin, regularly spaced and of equal size, with corresponding pits in the lower valve, which on the left side, may be seen following round the margin of the hinge area, as also the hood-like tip of the upper valve; outside of this is a broad, somewhat undulated margin, of a slate-coloured or livid tint. Interior dead-white; there are also groups of punctures on the side opposite the cicatrix.

Length an inch and a half; breadth an inch.

Inhabits the Feejee and Samoa Islands.

The distinctive character of this shell is the series of denticles, about twice as long as broad, around the entire shell, and arranged perpendicularly to the margin, tinged purplish or livid slate-colour. One young specimen has no coloured margin, but the peculiar denticles are present.

Figure 576, exterior of an elongated specimen; 576 *a*, interior of the lower valve of a rounded specimen; 576 *b*, upper valve of the same.

OSTREA DISCOIDEA (*Gould*).

T. subcircularis, planulata, tenuis, purpurea: valvâ superior lineis crebris albidis radiata; valva inferior major, radiatim plicoso-rugosa, colore saturiori: cavositas parva, argentata, purpureo-marginata; margine propè apicem plicoso-crenulato.

Ostrea discoidea, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 347. Dec. 1850. Expedition Shells, 97.

SHELL small, thin, shining, nearly circular, compressed, purple-brown. The upper valve is compact, pretty regularly radiated with coarse, rather distant, whitish lines. The lower valve is larger than the upper, of a more intense purple colour, and corrugated with small, interrupted radiating folds. The area near the beaks, by which it adheres, is very small. The cavity within is very small and shallow, light leaden-colour, with bright, silvery reflections, the surrounding limb broad, pure white, and the margin of the lower, which projects beyond the upper valve, is purple. Muscular scar transversely elongated, and very narrow. Hinge delicate, the margins of the valves on each side crenulated with fine, transverse folds, sometimes broken up into granules for about one-third the circumference.

Length an inch and a half; breadth two inches.

Habitat unknown. (*Bay of Islands, New Zealand, according to label on type - LADD*)

I have seen but one specimen of this delicate and well-formed oyster; and notwithstanding the usual inconstancy of form in the species of this genus, I think its characters are so diverse from any hitherto published, that it may be safely pronounced undescribed. The small, purple-striped, West India oyster (*O. Brasiliana*), is similar to it.

Figures 578, 578 *a*, views of the exterior and interior of the shell.

OSTREA MORDAX (*Gould*).

T. petrosa, angusta, lunata: valva inferior concava, digitis triangularibus erectis fusciscentibus marginata: valva superior minor, planulata, margine profundè sinuato et granulato, sinibus cum digitis coaptantibus: interior albida, olivaceo-maculata; cicatrice elongatâ, valdè incrassatâ, nigrâ: area cardinalis planulata, lata.

Ostrea mordax, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 346. Dec. 1850. Expedition Shells, 96.

SHELL small, very solid, narrow and elongated, spatulate, curving a little to the right, of a very condensed structure, showing vestiges of a thin, olivaceous epidermis between each layer, when abraded, and marked with very close-set lines of growth. Lower valve concave; upper valve flat, much smaller, and setting deeply into the lower. Its edges are scalloped with numerous rounded sinuosities and digitations, which are adapted to corresponding erect, triangular, tooth-like folds in the lower valve: these digitations are mostly stained with sienna-brown: on the inner side, opposite to the sinuations, and close upon them, are coarse, compressed, granular denticles, perpendicular to the margin, quite large near the hinge, and extending out each side of the hinge area, but growing smaller and more numerous towards the tip; a corresponding series of pits in the under valve. Interior dingy white, with olive or sienna stains; cicatrix elongated, black, very thick, and becoming quite elevated at its ventral end; hinge area flat, broad, a little tortuous.

Length two inches; breadth one inch.

Inhabits the Feejee Islands.

The horizontal digitations of the upper valve fitting into the erect canine teeth of the lower valve, together with the denticles within, and the black, elevated cicatrix, may serve to identify this species. It grows in groups so firmly adherent and interlocked that it is impossible to separate the specimens; and the upper valve fits so deeply into the lower as to render it impossible to open them without fracture. It is a well-characterized species of a genus difficult, from its protean forms, to separate into species. Its solid and dense texture are also peculiar.

Figure 575, group of shells; 575 *a*, interior of the valves.

CLASS BRACHIOPODA.

CRANIA RADIOSA (*Gould*).

T. suborbicularis, inequivalvis, crassiuscula, citrina, costulis radiantibus, divaricantibus et striis concentricis cancellata; valvâ superiori convexâ, apice acuto, post-mediano; valvâ inferiori planulatâ, concentricè laminosâ et interdum versus peripheriam radiatim costulatâ, fissurâ minutâ perforatâ: intus cristâ acutâ, in valvâ inferiori apophysin furcatum gerente, bipartita; cicatricibus incrassatis; marginibus ciliatis.

SHELL small, rounded, rather thick, of a dull citron-yellow colour, inequivalve, the upper valve cancellate with concentric ridges and fine, rounded, radiating ribs, many of which subdivide near the margin; the apex is at the posterior third, acute and distinct; lower valve nearly flat, or even concave, according to the form of the object to which it adheres; rudely laminate concentrically, or sometimes with ribs near the margin, as on the upper valve; its central portion is radiately corrugated, so as to indicate the place of the apex; below

this point, towards the ventral margin, is a depressed, oval area, in which is a delicate fissure communicating with the interior; this area is usually covered by a membrane, so that the fissure is not seen till the membrane is removed; on the interior of this valve is a delicate median crest, rising into an apophysis, which is bifid at tip, at the base of which the fissure opens by a minute puncture. Upper valve having a more delicate median crest, on each side of which are the thickened scars for the attachment of the muscles; inner edge of the valves ciliated; at the hinge margin of the upper valve are two tubercles, forming a shelf, on which the edge of the lower valve rests.

Diameter about one-third of an inch; width about one-eighth of an inch.

A single specimen was found at Rio Janeiro, and partially examined, by Mr. Couthouy. It is apparently the same as the shells here described, which were collected by Dr. Geo. H. Perkins, at Cape Palmas, Liberia. Their identity, however, is not certain, and the description must be considered as applying to the African shell.

I have placed this shell in the genus *Crania*, in the first place, because it seems to accord in most respects with the characters of that imperfectly understood genus; and secondly, because it is by no means clear that the genus *Orbicula*, the only other one to which it could be referred, is not essentially the same thing. The only distinction which Deshayes makes between them is, that the latter has a pedicle of some length by which it is attached to foreign bodies, while the former adheres directly. This seems to be a frivolous distinction, and one impossible to be made out unless the animals can be carefully observed during life. Mr. Couthouy distinctly observed such a tendon. Lamarck gives the different texture of the shell as the distinctive character; but specimens of the above show various degrees of thickness, from thin, horny valves, almost destitute of muscular cicatrices, to those of massive thickness, with prominent cicatrices. The little bifid apophysis is easily broken off, and therefore not always found; and the fissure in some specimens appears to be closed up, with only its vestiges remaining.

Figures 580, 580 *a*, upper and under valves, enlarged; 580 *b*, edge view; 580 *c*, interior; 580 *d*, the tendon; 580 *e*, natural size.

TEREBRATULA PULVINATA (*Gould*).

T. tenuis, lenticularis, orbiculato-trigona, albida, quincuncialiter punctata: valva minor convexa, latior quam longa, marginibus lateralibus rectis: valva major convexior, æquè longa ac lata; apice rectangulari, truncato, lateribus incumbentibus; foramine modico, circulari: apophysis branchialis tenuissima, reflexa, incumbens.

Terebratula pulvinata, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 347. Dec. 1850. Expedition Shells, 97.

SHELL thin and delicate, orbiculate triangular, lenticular, yellowish-white, shining, and apparently smooth, but when examined by a magnifier the surface is found to be tessellated with elongated dots arrayed in quincunx, which seem to be specks of opaque white, rather than punctures. The valves are regularly convex, the large one most so, the smaller one about four-fifths the length of larger, broader than long, its anterior margin semicircular, its posterior sloping in a right line each way, forming a very obtuse angle; larger valve quadrant-shaped, right-angled at apex, which is truncated, and a very little curved; sides incumbent, forming large areas; ligament aperture small, circular; internal apophysis delicate, tape-like, the two branches curving forwards and inwards, then recurved, uniting towards the beak.

Diameters five-eighths of an inch; width one-fourth of an inch.

Inhabits Puget Sound, Oregon.

As in other species of this genus, individuals differ much in form, some being much more globose than others; and in some there is an angular gibbosity along the middle of the larger valve. It compares with *T. vitrea*; has the same surface, colour, and general form, but in front is more rounded; its posterior outline is more rectilinear; the incurved areas of the beak are much more flattened and broad; the aperture is larger, and with elevated walls.

Figures 581, 581 *a*, sides of the shell; 581 *b*, edge of the shell, in outline; 581 *c*, details of sculpture, enlarged; 581 *d*, 581 *e*, views of the apophysis.

TEREBRATULA CAURINA (Gould).

T. parva, fusco-cinerea, transversa, convexiuscula; quincuncialiter punctata, costis angulatis ad duodecim interdum bifurcatis radiata; margine ventrali circulari, flexuoso; apice acuto, rectangulari; lateribus rectilinearibus, incumbentibus; rostro brevi, vix curvato; foramine circulari, interrupto: apophysis branchialis tenuissima, angustata.

Terebratula caurina, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 347. Dec. 1850. Expedition Shells, 97.

SHELL small, dusky ash-colour, moderately convex, rather broader than long; ventral margin rounded, with a central broad flexure, and corresponding depression in the smaller, and angulation of the larger valve; surface with twelve or more obtusely angular, radiating ribs, gradually enlarging, and sometimes bifurcating; interspaces and elevations about equal; the whole with microscopic opaque dots; small valve having the apex a little pointed, and the posterior outlines otherwise rectilinear, and forming a very obtuse angle; large valve forming about a right angle at beak, but with the lateral outline concave, and the margin incumbent, forming a broad nearly flat area; beak but little raised, pointed; the ligament aperture very large, circular, a part of its margin formed by the apex of the small valve; internal apophysis similar to that of *T. pulvinata*, but much more delicate and thread-like, the two branches curving towards each other so as almost to touch.

Length half an inch; breadth eleven-twentieths of an inch.

Inhabits Puget Sound, Oregon.

T. australis is closely allied, but is more elongated and more convex; the beak is also elongated and the ribs are less prominent.

Figures 582, 582 *a*, lateral views of the shell; 582 *b*, edge of the shell, in outline; 582 *c*, sculpture; 582 *d*, 582 *e*, views of the apophysis.

TEREBRATULA PATAGONICA (*Gould*).

T. parva, solidula, albida, ovato-triangularis, sub-trilobata, quincuncialiter punctata: valva opercularis plana: valva major convexa, sub-gibbosa, costis tribus medianis et utrinque costis quinque divaricantibus ornata; rostro brevi, marginibus inflectis; foramine magno, rotundato: apophysis branchialis exilis.

Terebratula Patagonica, GOULD; Proceed. Boston Soc. Nat. Hist., iii. 347. Dec. 1850. Expedition Shells, 97.

SHELL small, solid, dirty white, ovate-triangular, somewhat trilobate; length and breadth about equal; small valve nearly flat, large valve deeply concave; surface finely sculptured in quincunx; large valve somewhat gibbous along the centre, smooth near the beak, with about fourteen rounded ribs, three of which are central ones along gibbosity, parallel, and about five divaricating submarginal ones on each side. Beak short, margins inflected; ligament aperture large, rounded: upper valve sculptured in the same manner; branchial supports very delicate.

Length one-third of an inch; breadth one-fourth of an inch; height one-fifth of an inch.

Inhabits the coast of Patagonia.

A smaller and less transverse species than the preceding, and the disposition of the ribs is quite different. It is also closely related to *T. australis*, but differs from it in the same respects.

Figures 583, 583 *a*, lateral views of the shell; 583 *b*, edge of the shell, in outline; 583 *c*, details of sculpture, enlarged; 583 *d*, 583 *e*, views of the apophysis.

CEPHALOPODA.

ARGONAUTA GENICULATA (*Gould*).

Corpus ovatum, supra gibbosum: caput breve, angustum: oculi magni, prominentes, pupillo nigro; iride aurato: siphon conicus, elongatus: os magnum; rostris fortibus: brachii basi adnati, superioribus cylindraceis, geniculatis, vexillum semiellipticum, flocculosum gerentibus; brachiis secundis longissimis: color virescenti-argentata, punctis chokolatis oculatis variegata.

Body ovate, slightly gibbous on the back, like the abdomen of a spider; aperture large, transverse, extending above the eyes. Head narrow, short, scarcely affording space for the eyes. Eyes large, prominent, almost pedunculate; pupils black, surrounded by an inner circle of golden yellow, enclosing which, is a circle of gold, silver, and green combined. Siphon long, extending nearly one-third the length of the arms, pyramidal, with convex outline, and small aperture, somewhat compressed from above downwards. Mouth rather large; beaks very strong, lower part convex beneath, not carinate. Arms all connected at base by a membrane; second pair longest. Cupules numerous, nearly sessile, rather crowded, especially on the third pair, where there are about sixty; on the second pair, the two series diverge at the distal third; on the fourth pair, they are less crowded, and affect somewhat a single series; the upper pair consists of a rounded, sub-cartilaginous peduncle, bearing cupules, which, at the point where the banner-like membrane commences, forms a sort of joint, and is bent at right-angles, so as to present the reverse side of the membrane. This membrane is elongate, ovate-triangular, having its inner surface honey-combed with a network of cells; after diverging somewhat, the cupules coalesce at its upper margin, along which they run to the extremity, but do not pass round to the lower margin. Colour formed by numerous chocolate dots, surrounded by annuli of a golden green, beneath which, the body is pale straw-colour; the head, arms, and belly have,

between the annulations and dots, a brilliant silvery lustre, with a greenish play of colour; after remaining in spirits, it dries of a slaty hue, on which the brown dots are still apparent.

Whole length about six inches; length of sac above, two and three-fourths inches; below, two and a half inches; breadth one and a half inches; length of siphon one and three-fourths inches; length of superior arms five inches; of inferior arms four and a half inches; superior lateral, six inches; inferior lateral, four inches; diameter of umbrella from side to side an inch and a quarter; vertical, one and three-fourths inches.

Taken in a seine near the Sugar Loaf, Rio Janeiro, and its colour described by Mr. Couthouy during life.

The SHELL belonging to this animal is not known. No impressions existed on its surface, answering to the folds of a shell, so that it had not very recently, if ever, occupied one; it is conjectured that the shell is formed by the female, for the protection of her eggs during nidification. The ANIMAL resembles most nearly *A. argo*, especially the one figured by Férussac and D'Orbigny, pl. 6; but the membrane of the umbrella is much more distinct between the upper and lower pairs of arms, the dotting of the surface is finer, and the banner is much more elongated, with the series of cupules much less definite and extensive around it. From *A. tuberculata* it differs in having a longer siphon, much greater number of cupules, and a differently formed banner membrane. The joint-like flexure of the first pair of arms is different from what is described of any other species.

Figure 585, the animal, and its details.

OCTOPUS MEGALOCYATHUS, (*Couthouy MS.*) (*Gould*).

Corpus ovatum, læve, chocolatum lineis cinereis marmoratum, membranâ laterali angustâ quasi natatoriâ munitum: caput angustum: oculi prominuli: siphon bulbosus, curtus: os magnum, rostris nigris: umbella amplissima: brachii longissimi; acetabulis confertis, maximis.

Body ovate, smooth, the tunic forming a narrow, membranous

lateral border, somewhat like a natatory membrane. Head not more than one-third as wide as the body; eyes prominent, of medium size, the iris blue-black, the pupil silvery green, surrounded by light brown lids. Aperture extending to the eyes; natatory tube short and small, bulbous at base, truncate at tip. Mouth rather large; beaks black; arms very large at their base, and gradually tapering. Umbrella very large, the membrane passing to the very tip of each arm, along the edge most distant from the dorsal median line; the contiguous faces of the dorsal pair are therefore destitute of a membrane, except at the base, while the contiguous faces of the lower pair are furnished with them. Cupules crowded and alternating, short, on a broad-based, constricted peduncle, the termination divided into segments by radiating furrows, and these again subdivided by finer lines of a milk-white colour, somewhat ochreous at centre. They are very large, some of them being an inch and a quarter in diameter. Colour on the back dark chocolate, delicately marked with streaks of ashy white; belly much paler; inside of arms bluish-white.

Length of body to the opening on the belly, 5.2 inches; length to the eyes, 7.5 inches; breadth of head, 2.7 inches; circumference of body at the largest part, 11.2 inches; length of arms from the base, 34 inches; circumference of arms at the largest part, 3.1 inches; diameter of the largest cupule, 1.3 inches; length of tube, 1.5 inches; breadth of umbrella, 8 inches; total length, 43 inches.

Found by Lieutenant Alden, near the shore in Orange Harbour, in the vicinity of the observing station.

This very large species is remarkable for the magnitude of its umbrella and its cupules, but especially for the narrow membrane extending along the sides of the body, which has not been noted as belonging to any other species except *O. membranaceus*, Quoy. It is closely allied to *O. Fontainianus*, D'Orb., so remarkable for the cluster of four or five large cupules near the bases of the lateral arms, while all the others are very much smaller. *O. tehuelcha*, comes from the same region, and has something of the same general characters; but the comparative size of the head and the umbrella is quite different, the membrane along the arms being entirely wanting. The description is mostly made from notes by Mr. Couthouy, whose name I adopt.

Figure 586, 586 *a*, two views of the animal, reduced, with details.

OCTOPUS MIMUS (Gould).

Corpus parvum, ovato-globosum: caput angustum: oculi parvi, exstantibus; pupillo nigro; iride aurato et miniato: apertura ad angulos maculis rufis flavo-cinctis oculos simulantibus signata: brachii robusti, corpore quater excedentes, pro longitudine 3, 2, 4, 1; acetabulis remotis, purpureo cinctis: umbella amplissima: os eccentricos; rostris nigris: siphon parvus, tenuis: tunica reticulata, musiva, coloribus ochraceis, maculis lunatis transversis fuscis ordinatim picta.

Body small, short, ovate-globose, rounded at extremity. Head less than one-half the width of the body, having a well-marked neck between the body and the eyes. Eyes small and moderately prominent; pupil narrow and black; iris golden, encircled with vermillion. Aperture extending above the eyes, and coloured at its upper commissures with brown, encircled with yellow, so as to resemble another pair of eyes. Arms large at their origin, about four times the length of the body; comparative length 3, 2, 4, 1. Umbrella very large, its lateral diameter being about six inches, and its vertical diameter about four inches, of which about three inches are above the mouth. The membrane extends along the arms two-thirds of their length; its spread between the upper arms is three and a half inches, between the lateral arms about two inches. Mouth near the ventral margin of the umbrella, surrounded by elevated lips; jaws black. Cupules distant from each other, and of medium size; there are about forty distinct pairs on the two lower thirds of the lower pair of arms, when they become enveloped in a membrane for the rest of the length; they are moderately elevated, the lip white, with a purple stripe around the summit; interior radiately furrowed, and with a small central opening. Locomotive tube small, slender, tapering, with a very small opening. Surface covered with a mosaic or rubble-work, of irregular, rather coarse reticulations, so that it is quite harsh. This roughness or reticulation extends to every portion of the exterior. It is also found, less conspicuous, on the interior, even on the surface of the cupules. The ground colour is ochreous-orange, with blue reflections, and with transverse, crescentic cloudings, produced by innumerable fine dots of dark chocolate, which extend over every part of the arms and umbrella; the coloration of the interior is paler and less distinctly clouded.

Length of body to base of tentacles, three and a half inches; breadth, two inches; length of arms, dorsal, fourteen inches; upper lateral, eighteen inches; lower lateral, twenty inches; ventral, fifteen inches; diameter of largest cupules, two-fifths of an inch.

Taken at Callao, Peru.

The peculiarities of this species are its reticulated surface, and narrow, transverse clouds of chocolate colour; its large umbrella, with broad membranes running up the arms; its scattered cupules, and the apparent possession of two pairs of eyes. Described from a figure by Mr. Drayton from life, and from specimens preserved in spirits.

Figures 587, 587 *a*, two views of the animal, with details.

OCTOPUS TETRICUS (*Gould*).

Corpus magnum, oblongo-ovoideum, fissurâ longitudinali sub-bilobatum: caput subquadratum, vix corpore disjunctum, rigidum: oculi parvi, occulti: apertura parva, crescentica: brachii robusti, abbreviati, pro longitudine 2, 3, 4, 1; acetabulis ad brachios laterales majoribus: os minutum, rostris inclusis: umbella ampla: tunica plus minusve verrucosa, superciliis et dorsibus brachium superiorum cirrhigeris.

Body large, longer than broad, ovoid, with a longitudinal constriction on the under side passing round the base. Head nearly as wide as the body, subquadrate, compressed vertically, very rigid, with but a slight constriction between it and the sac. Eyes minute, nearly concealed. Lower aperture small, crescentic, acutely lobed at the centre of the lip. Siphonal tube short, conical, truncate at tip. Arms contorted, very robust, subquadrate, an inch in breadth at a short distance from the mouth, comparatively short, tapering to a fine point; comparative length 2, 3, 4, 1. Mouth very small, contracted so as entirely to conceal the jaws in the specimen examined. Umbrella large, widest from side to side, the membrane passing up the back of the arms two-thirds their length. Cupules very large, crowded, especially on the lateral pair of arms, on which they are one-third longer, distinct quite to the tips of the arms; about eighty or ninety pairs.

Surface rough, covered with warty granulations, which are especially large and prominent on the back of the head and the upper half of the umbrella; on the lower face they are less prominent and much smaller, and over the posterior part of the sac they are flattened and even pitted at the centre, resembling pavement or rubble-work. Over the eyes are three elongated tubercles or cirrhi, and apparently one below; and a longitudinal series of three of them running along the head to the back of the four superior arms.

Length of sac to the mouth, two and a half inches; length of upper arm, twelve inches; of superior lateral arm, sixteen inches; of inferior lateral arm, sixteen inches; of inferior arm, thirteen inches; breadth of umbrella, five inches; breadth of arm, two or three inches from origin, two and a half inches; diameter of largest cupules, half an inch.

Found near Sydney, New South Wales.

This is a very robust and powerful species, closely allied to *O. vulgaris*, which it resembles more than any other species. As presented by the specimen from alcohol, the arms are unusually stout. And the whole concave face of the umbrella is completely paved with large cupules, merely a narrow fissure appearing to mark the division of the arms. The mouth is so small, that the jaws are entirely concealed. The surface is coarsely reticulated or warted, like *O. vulgaris*, resembling the skin of a tortoise; but the size of the eyes, the arrangement of the cirrhi, and other obvious marks, distinguish them. *O. rugosus*, Blain. (*O. granulatus*, Lam.), is also closely allied, but has a smoother surface, only a single cirrhus, and arms less developed.

Figure 588, the animal, with details.

OCTOPUS FURVUS (*Gould*).

Corpus pyriforme, læve: caput elongatum, deorsum dilatatum: oculi magni; cirrhis tribus superciliaribus ornati; pupillo nigro; iride aurato: brachii longissimi, graciles, subequales; acetabulis magnis, approximatis: umbella parva: tunica ochracea, interdum fuscescens vel cinerascens.

Body elongated, pyriform, smooth, or faintly wrinkled. Head long, the distance from the aperture to the base of the arms being nearly as great as to the posterior extremity. Aperture not extending to the eyes, the lip having a slight angular projection at the centre. Tube broad at base, soon becoming slender and cylindrical, truncate at tip, reaching to the origin of the arms. Eyes not prominent, rather large, pupil black, iris golden; on the superciliary region are three cirrhi; the largest over the posterior angle of the eye, the posterior one near the angle of the aperture, the other at about the same distance in front of the middle cirrhus. As seen, they were wart-like, but doubtless have the property of being extended. The neck is expanded below the eyes, so that the ventral surface of the head is broader than the dorsal. Arms very long and slender, and nearly equal in length. The cupules are large, nearly contiguous, on short peduncles, with a thin lip, the interior radiately grooved, and the margin of the inner orifice tumid; ninety-six pairs were counted on the upper arms. The umbrella is small, extending laterally much farther than from before backwards, and not extending far along the sides of the arms. The ground colour is ochreous, but constantly varies, sometimes being nearly black, or mottled with ash-colour, or entirely ash-coloured, the dark shades being always produced by minute dottings. The under side is paler, and shaded with orange-coloured dots. Cupules milk-white.

Length of body, six inches; of arms, about forty inches.

Obtained in the market at Rio Janeiro, and from fishermen.

This animal is remarkable for its long and slender form, its small umbrella, its dusky colouring, and for the warty cirrhi above the eyes. Its general form and coloration are like those of *O. tetracirrhus*, Delle Ch.; but it is more slender, the cirrhi are different in number and position, and the membrane between the arms is far less developed. Its proportions are much like those of *O. macropus*, Risso, but its coloration is very different.

Figure 589, the animal, with details.

OCTOPUS ORNATUS (*Gould*).

Corpus subglobosum: caput dimidiam corporis latitudinis adequans: oculi

parvi, haud prominentibus ; pupillo nigro ; iride argentato : apertura lata : os parvum, eccentricum : umbella parva : brachii graciles, attenuati, pro longitudine 2, 4, 3, 1, superioribus robustis, alteris gradatim gracilioribus ; acetabulis numerosissimis, confertissimis : tunica reticulato-papillosa, areolis pallidis ovalibus signata ; supra aurantiaca, strigis longitudinalibus flavidis quinque, et maculis alternantibus etiam intra-brachialibus variegata.

Body subglobose, the length exceeding the breadth about one-twelfth. Head two-thirds as long as the body, and about half its breadth, of nearly equal width throughout, the eyes being but very slightly prominent. Inferior opening broad, the lip transverse and simple ; eyes small, the pupil black, with a silvery iris. Mouth small, situated at the lower third of the umbrella, which is rather small, but well-marked, the membrane not prolonged up the arms. Arms compressed, long and slender, attenuated to a thread, comparative length 2, 4, 3, 1, differing much in size, the upper ones being very robust, the second, third, and fourth pairs being successively more slender, the latter being remarkably slender, not half the size of the upper ones. Cupules of medium size, nearly sessile, crowded, very numerous, extending to the tips of the arms ; they commence in a double series on the upper arms, while on the lower ones the first six are in a single series. The surface is coarsely reticulate-papillose, with a series of oblong-oval, smooth, and colourless patches along the back of the arms and around the sac, somewhat resembling bullæ. The ground colour is deep orange ; beneath somewhat clouded with white ; above variegated with five longitudinal, buff stripes, the median one extending to between the eyes, the two lateral ones curving on each side, like meridian lines, and extending only to the neck ; between these lines, around the middle of the sac, are deep brown patches, and also between the bases of the arms ; there are also brown mottlings along the back of the arms. These, with the pale, bubble-like patches around the base of the sac and along the arms, give a very gay and diversified colouring.

Length of sac to inferior opening, one and a half inches ; length along the back to the umbrella, two and a half inches ; breadth of sac, one and three-fourths inches ; breadth of neck one inch ; breadth of umbrella from side to side, three inches ; breadth above mouth, two inches ; below mouth, one inch ; length of arms, upper pair, twenty

inches; upper lateral, twenty-four inches; lower lateral, about twenty inches; lower pair, twenty-one inches.

Obtained at the Sandwich Islands at Oahu, and Maui.

No other described species approaches to this in form and coloration, except *O. macropus*, Risso. The comparative length of the arms is different (1, 2, 3, 4), the body is more elongated, and there are no cirrhi about the eyes in the latter species, besides a sufficiently well-marked distinctness of coloration. Described from specimens preserved in spirits, and from a coloured drawing.

Figures 590, 590 *a*, two views of the animal.

OCTOPUS PUSILLUS (*Gould*).

Corpus parvum, subglobosum: caput æquè longum ac latum: oculi magni, protrusi; apertura parva: brachii robusti, contorti, citò attenuati; pro longitudine 1, 2, 3, 4; acetabulis magnis, confertis: umbella ampla.

Sac small, subglobose; abdominal aperture small, occupying about one-third of the circumference. Head as wide as the body, with a slight constriction between them; orbits large and prominent; arms stout, about two inches in length, thick at the base, and rapidly tapering to the tip; proportional length 1, 2, 3, 4. Cupules crowded, and large, occupying the whole breadth of the arm, about fifty or sixty in number; outer lip simple; inner aperture large. Umbrella large, the membrane attached to one-third the length of the arms, which are contorted by its contraction.

Whole length about three inches.

Obtained at Mangsi Island, China Sea.

This may be the young of some large species, like *O. rugosus*, but as in its present state it presents essential differences, it has been thought best to describe and delineate it, as one of the means for

enabling others to settle the question. The surface is smooth and soft, and dries of a slaty hue. Described from specimens in spirit.

Figure 591, the animal, natural size.

OCTOPUS MOLLIS (*Gould*).

Corpus parvum, elongatum: oculi valdè exstantes: siphon bulbosus, elongatus: brachia graciles, basi haud approximati pro longitudine 4, 3, 2, 1; cupulis remotis: tunica (vino conservata) ochracea, rufo punctata, ramusculis venosis ad dorsum brachiorum notata.

ANIMAL about the same in size as the preceding species, but is much more delicate and slender. The arms, especially, are quite slender, and do not approach a contact with each other at their origin; so that there is a broad sheet of thin, delicate membrane between them, forming the umbrella. The siphonal tube is bulbous and long, truncate at tip; the eyes are very prominent; the proportionate length of the arms is 4, 3, 2, 1, just the reverse of the last species. The cupules are thirty or forty in number, not crowded, having their inner opening very small. The surface is quite smooth and delicate, of an ochreous ground colour, after immersion in spirits, thickly dotted with brown, and with delicate, branching, transparent venations or furrowings, running up the back of the arms at their bases.

Whole length about three inches.

Obtained at Tutuilla, Samoa Islands.

Like the preceding, this may be a young specimen, but evidently a different species. Its characters are most like those of *O. Indicus*. It is more delicate in all its characters than any other species I have seen. Described from specimens in spirits.

Figure 592, the animal, natural size.

SEPIOTEUTHIS ARCTIPINNIS (*Gould*).

Corpus elongatum, ovato-lanceolatum, pinnis perangustis, arcuatis muni-

tum : caput oblongum corpore angustius : brachii sessiles curti, crassi, pro longitudine 2, 4, 3, 1 : brachii tentaculares æquè ac corpore longi, triente extremo dilatato-lanceolato, series quatuor acetabulorum gerente : os magnum, cupuliferum : tunica brunneo-purpurascens rufo-punctata, infra pallidior.

Body elongated, ovate-lanceolate, tapering gradually backwards to a blunt point. Fins broadest at about the posterior fourth, where, together, they equal the width of the body, thence tapering in each direction gradually, and without any angle or dilatation. Colour dark purple brown above, paler beneath, everywhere finely punctate with dark brown dots. Head narrower than the body, longer than broad. Sessile arms rather short and stout, armed with two rows of cupules; the superior pair shorter than the head; the first lateral pair a third longer than the superior, and somewhat longer than the head; the second lateral pair a little longer than the first; the inferior pair nearly equal to the second lateral; tentacular arms nearly as long as the body, compressed, the distal third having a lanceolate dilatation, bearing four rows of delicately pedunculated cupules, armed at the margin with delicate black crochets. Mouth large; lip folded and projecting, with two or three minute cupules at each fold.

Length of body, six inches; of head, two inches; of superior arms, two and a half inches; of inferior lateral arms, three inches; of tentacular arms, eight inches; of cup-bearing portion, two and three-fourths inches; greatest breadth two and a half inches.

From the island of Maui, Sandwich Islands.

It closely resembles *S. loliginiformis*, D'Orb., from the Red Sea, which has a much more decided expansion of the fins at its posterior half, and the tentacular arms are much shorter. The narrow and regularly tapering fin is its distinguishing character. Described from specimens in spirits.

Figure 593, the animal, with details.

OMMASTREPES INSIGNIS (Gould).

Corpus magnum, subcylindraceum, posticè angustatum : pinna trientem

longitudinis corporis superans, rhomboidalis, acutangularis, latior quam longa: siphon pyriformis, arcuatus: caput breve, latum, supra convexum, infra excavatum: oculi parvi: brachii sessiles robusti, triquetri, subequales, pro longitudine 2, 3, 4, 1, trientem proximum paris inferioris acetabulis privatum vel fimbriatum; acetabulis parium lateralium majoribus: brachii tentaculares graciles, vix ad extremitatem dilatati, ad trientes duos extremos acetabulis instructi: color (vino conservata) rufo-cinerea.

Body large, subcylindrical, tapering backwards; fin more than one-third the length of the body, rhomboidal, one-third broader than long, acutangular; anterior of body obliquely truncate, with a slight median angle above. Siphon pyriform; aperture curving simply downward. Eyes small, naked; head short and broad, convex above and excavated beneath for the reception of the siphon. Colour drab, almost destitute of dots, darker along the back. Sessile arms robust, triquetrous, of nearly equal length, about twice as long as the head, ranking 2, 3, 4, 1. The lower pair for one-third their length are destitute of cupules, and fimbriated with a double range of compressed, adnate lobules, of which the exterior is longest; the remaining two-thirds with a double row of small, alternating cupules; the upper pair has similar cupules, and all have them commence at the base; the two lateral pairs have the cupules along the middle very large (one-eighth inch), on long, eccentric pedicles; the tips of all of them are furnished with minute cupules, on long, threadlike pedicles, dilated at base. The tentacular arms are a third longer than the lateral, triquetrous at base, slender and compressed throughout, scarcely dilated towards tip; cupules commencing at the lower third in a double series, small, when past the middle they become very large (six on each side,) alternating with small ones; the large tentacular cupules have a circle, with about fifteen teeth, of a metallic copper hue; the small ones, and those of the sessile arms, have a half circle of eight points. Mouth small, the surrounding membrane without cupules, with a process between the upper pair of arms, and one to each of the other arms.

SHELL slender, diamond-pointed in front, about half an inch broad and eight and a half inches long, tapering backwards regularly, the posterior two inches, dilated into a paddle-shaped blade, in which the different laminæ converge to the point.

Length of body, ten inches; breadth anteriorly, three inches; length of fin, four inches; breadth six inches; length of head, two and a half inches; breadth at eyes, two and a half inches; length of longest sessile arm, six and a half inches; of shortest, four and a half inches; length of tentacular arms, ten inches; diameter of eye, three-quarters of an inch.

Obtained at Feejee Islands; Antarctic Seas. *Dr. Holmes.*

The only species with which this bears a close relation is *Loligo todarus*, Rafin., from the Mediterranean. In that species, the inferior arms are like the others covered with cupules; the tentacular arms have cupules their whole length. It agrees in the form of the shell, and the colour and arrangement of the cupular denticles. *Loligo Bartrami*, Fer., has all the arms fringed somewhat like the lower pair. *L. sagittata*, Lam., has the general form and arrangement of the arms, but all of them are supplied throughout with regularly graduated (in size) cupules.

In another specimen, marked "Antarctic Seas," the peculiar fringe on the lower tentacles is wanting, but the cupules are very small, and are narrowed, as it were, into a single series. All the tentacles are more slender. Described from specimens in spirits.

Figure 594, the animal, with details; 594 *a*, the dorsal shell.

ONYCHOTEUTHIS RUTILUS (*Gould*).

Corpus breve, anticè latum deinde sensim angustatum, dorso carinatum; pinnis magnis dimidium corporis superantibus, longioribus quam latis: caput subquadratum, subtus excavatum: oculi nigri, maximi: siphobrevis, cylindraceus: brachii sessiles triquetri, dimidium corporis adequantes, ordine longitudinis 4, 3, 2, 1, acetabulis pedicellatis sub-uniserialibus instructi: brachii tentaculares robusti, cylindrici, unguibus ad decem pedunculatis muniti: color supra metallica, reflectionibus violaceis et auratis; infra salmonacea; capite coloribus violaceis, lilacinis, aurantiacis, flavis, etc., ornato.

Body short, broad in front, and immediately narrowing backwards, and ending in a produced point, giving a lanceolate form, carinate

along the back. Fins large, more than half the length of the body, nearly meeting at the base, longer than broad, heart-rhomboidal, the lateral angles a little rounded, the posterior angle acuminate; head nearly as wide as the body, subquadrate, the sides wholly occupied by the orbits, excavated beneath, for the siphonal tube, which is short and cylindrical. Eyes black, very prominent.

Sessile arms about half as long as the body, triquetrous; comparative length, 4, 3, 2, 1. Cupules on large pedicles, nearly in a single line. Tentacular arms shorter than the body, a third longer than the sessile arms, stout and cylindrical, furnished with nine or ten hooks, on long peduncles, and occupying about one-fourth the length of the arm, which portion is dilated for that purpose. Mouth very small.

The colours are very beautiful, the body and head above being of a brilliant metallic hue of gold and violet, clouded with salmon-colour on the fins; back of the arms umber, with bluish reflections; beneath salmon-coloured, the head and arms shaded and mottled with violet, orange, yellow, lilac, &c., presenting a marked contrast with the uniform colour of the body.

Whole length, eight and a half inches; of the body, four inches; of the head, three-fourths of an inch; of the lower sessile arm, two inches and a quarter; of the tentacular arm, four inches; greatest breadth of body, an inch and one-eighth; of the fin, three inches and five-eighths; length of fin, two inches and a half.

Obtained in the South Pacific Ocean, near Sydney, New South Wales.

This beautiful species is somewhat allied to *O. Banksii*, Fer., but its proportions and colouring are different. Its short body and metallic bronzed surface are remarkable. Described from a drawing of a living specimen.

Figure 595, dorsal view of the animal.

ONYCHOTEUTHIS BREVIMANUS (*Gould*).

Corpus cylindraceum, vix dilatatum: pinna rhomboidalis, latior quam longa, quadrantem corporis superans: caput breve, subglobosum: oculi

mediocres: brachii sessiles curti, graciles, infimis longioribus, supernis brevioribus: brachii tentaculares brevissimi: color ex sanguineo violacescens.

Body cylindrical, somewhat bulging at the middle and tapering with a curved outline, rapidly. Fin rhomboidal, broader than long, the angles slightly rounded, somewhat more than one-fourth as long as the body. Head short, closely attached to the body, subglobose. Eyes of moderate size and prominence; sessile arms short and slender, the lower pair longest, and the upper shortest. Tentacular arms, very short, nearly destitute of a pedicle. Colour beautifully shaded with sanguineous and violaceous, the effect being produced by minute dottings.

Entire length, six inches; length of body, three inches and three-quarters; length of head, five-eighths of an inch; greatest diameter of body, five-eighths of an inch; breadth of fin, two inches and a quarter; length, one inch and three-eighths.

Obtained at sea, about 120 miles west of Tutuilla, Samoa Islands.

Described from a figure from life, by Mr. Agate. If the proportions are given correctly, as there is no reason to doubt, the extraordinary brevity of the tentacular arms, scarcely longer than the shortest sessile arms, is of itself enough to characterize the species. The figure is also supposed to represent the true dimensions.

Figure 596, dorsal view of the animal.

PTEROPODA.

THE following species of the order Pteropoda are here given, with a strong impression that some of them may have been described. But they are not satisfactorily identified with any figures of species I have seen. Indeed, with the exception of those given by D'Orbigny in his *Voyage dans l'Amérique Méridionale*, and by Eydoux and Souleyet in the *Voyage of the Bonite*, no figures or descriptions of any value have been furnished. These animals are seldom to be obtained except in the open sea, and require to be immediately figured by a skilful hand, with the aid of a microscope. Of course, very few have fallen under the eye of competent observers. Every addition to the knowledge of the general or detailed forms of this little-understood group of minute and beautiful objects, will be of service in the future disposition of its members.

The figures made by Mr. Dana evince careful observation and faithful delineation, and may be relied on as characteristic.

LIMACINA SCAPHOIDEA (*Gould*).

T. pellucida, involuta, scaphoidea: spira secunda, anfractibus tribus; ultimo amplo; apertura subcircularis; labro arcuato.

ANIMAL having the alar expansions elongate, obliquely rounded at tip, broadly united at base, and standing off from each other obliquely at an angle of ninety degrees. At their junction are two papillæ, each surmounted by a black spine or beak.

SHELL involute or nautiloid, the spire inclined to one side, exhibiting three whorls on the projecting side; the last whorl is very capacious, having the aperture rounded, and of nearly equal diameters; the lip seen in profile is concavely arcuate.

Diameter about one-tenth of an inch.

Taken in the equatorial Atlantic, and figured by Mr. Dana.

The genus of this shell is also somewhat uncertain. It bears a resemblance to *Spiriale rostrale*, figured in the Bonite, pl. 13, f. 1, the *Limacina inflata* of Gray.

Figures 602, 602 *a*, lateral and longitudinal views of the shell and animal; 602 *b*, natural size.

LIMACINA (?) CUCULLATA (*Gould*).

T. pellucida, planorboidea, altero latere anfractus quinque ostendens, altero anfractum unicum umbilicatum: apertura obliqua, campanulata, cucullata.

ANIMAL black, with ovate appendages, not intimately united at base.

SHELL colourless, planorboid, on one side presenting about five or six whorls, on the other, a single volution, with a large, umbilical pit. Aperture oblique, campanulate, and projecting beyond the whorl like a hood.

Diameter about one-fourth of an inch.

Found near an ice-island, within twenty miles of the Antarctic continent, lat. 66° S., long. 106° 20' E.

This is one of the few forms of the lower classes of animals obtained from the extreme South, and is, therefore, peculiarly interesting, although so imperfectly delineated. It is described from a pencil sketch by Mr. Agate. The genus is probably new, but must rank under *Limacina*, if among known genera. The name *AGADINA* might otherwise be employed.

Figures 601, 601 *a*, 601 *b*, three views of the shell, with the animal.

HYALÆA INERMIS (*Gould*).

T. ovato-globosa, posticè angustata, compressa et truncata, angulis posticis emarginatis, anticè rotunda: apertura angusta, transversa, labro haud porrecto. Animal alis transversis angustis ad angulum posticum emarginatis instructus.

ANIMAL, with the alar expansions flabellate, twice as long as their greatest breadth, convexly arched in front, anterior angle rounded, the ends with a deep slit at their anterior third, the posterior angle deeply and concavely emarginate; mantle oblong, with rounded posterior angles, extending on the back of the shell about one-fourth its length; interior mass heart-shaped, dusky.

SHELL ovate-globose, with both valves very gibbous, the smaller one most so; line of union flexuous; mouth narrow, lip simple, not projecting over the opposite valve; anterior end rounded, lateral lines somewhat converging; the posterior angles concavely emarginate, the anterior angle of the emargination slightly spinous: posterior extremity compressed, truncate, the outline very slightly convex.

Length seven-eighths of an inch; greatest breadth four-fifths of an inch; thickness equal to the breadth.

Described from a figure by Mr. Dana; locality not mentioned.

Figure 604, shell, with the animal; 604, 604 *a*, lateral and ventral views of the shell.

HYALÆA FEMORATA (*Gould*).

T. subcordata; angulis posticis productis, arcuatis et cornua subrecta, prælonga, retroversa, gerentibus. Animal alis transversis trapezoidalibus munitus.

Alar expansions transverse, rather longer than broad, the anterior and posterior margins nearly parallel, but slightly arcuate convexly,

terminal ends truncate obliquely, and a little concavely backwards, having a lateral laciniation near the anterior angles, and a longitudinal one in the posterior margin near the angle: the body of the animal is somewhat roseate, with a central dusky spot. Posterior cornua of the shell long, corpulent at base, somewhat tortuous, and running to a prolonged point.

Expansion of alar appendages an inch and a half; whole length of the shell and animal the same.

Obtained in the equatorial Atlantic.

Described from a figure by Dana. It is remarkable for its long and corpulent appendages.

Figure 603, animal as in life, with the shell.

CLEODORA EXACUTA (*Gould*).

T. pellucida, triangularis, subtus concava, supra per convexa anticè, rotundata, posticè valdè acuminata, lateribus concaviter arcuatis. Animal cervice longo et alis divergentibus oblongo-ovalibus instructus.

Alar expansions arcuate, rounded at extremity, the posterior edge loosely undulate; the basal lappet large and triangular; the conical papillæ at the mouth are dark, as well as the central abdominal mass; otherwise colourless.

The SHELL is an equilateral, spherical triangle, the base convexly rounded, and the sides concavely excavated, producing thus a long, acute caudal point: the under valve is slightly concave, and the upper valve very convexly arched: in front is a small opening, through which the neck of the animal passes.

Length about half an inch; greatest breadth equal to about two-thirds the length.

Found by Mr. Dana, in latitude 44° N., long. 154° W., that is, about 30° west of the mouth of Columbia River.

This resembles a West India species, which has the sides much more deeply concave, and the lateral angles prolonged into spines. Described from Mr. Dana's figures.

Figure 605, shell and animal enlarged ; 605 *a*, transverse section of the shell ; 605 *b*, natural size.

CLEODORA MUNDA (*Gould*).

T. elongato conica, modicè recurva, subcompressa ad apicem rosacea : apertura rotundato-elliptica. Animal alis ferè transversis latè coadunatis, obliquè triangularibus, subarcuatis instructus.

Alar expansions broadly united at base, ovate triangular, greatest breadth nearly equal to greatest length ; anterior margin convexly arcuate, with an acute spine at the middle ; posterior margin two-thirds the length of the anterior, concavely arcuate ; terminal margins rectilinear, convergent ; the angles minutely rounded ; surface exhibiting ranges of ciliæ ; basal lappet very small, forming a very low triangle. Head large ; eyes conspicuous. The alimentary tube is seen passing to the apex of the shell, which is occupied by a straw-coloured viscus, above which is a deep-green cylindrical mass : just behind the head is an excretory duct and its orifice, which has made half a spiral turn around the neck. At the superior third of the shell are seen scarlet bands of muscular fibres surrounding the mantle, which rises to a level with the mouth of the shell. The colour has a pale-roseate, somewhat iridescent tint.

SHELL acutely conical, moderately recurved ; aperture circular or somewhat oval ; tip roseate.

Length one-fourth of an inch.

Found in the equatorial Atlantic by Mr. Dana.

This is possibly *C. virgula*, Rang, as figured in the Voyage of the Bonite, pl. 8, f. 18-22 ; but as this is not satisfactorily determined, the excellent figure of Mr. Dana is introduced.

Figures 607, 607 *a*, front and lateral views of the animal and shell, enlarged.

CLEODORA PLACIDA (*Gould*).

T. elongato-conica, vix reflexa: apertura circularis. Animal alis oblongis obliquis, angustis, curtis, instructus.

Alar expansions small, basal union narrow, oblong, the posterior margin nearly rectilinear, the anterior margin convexly arcuate, with a prominent spine at the middle, extremities slightly emarginate at each angle, so as to give a generally-rounded outline: basal lappet small, triangular, nearly equilateral, the apex reaching nearly to the separation of the wings.

SHELL elongate, conical, recurved: aperture large and circular.

Length about one-fourth of an inch; diameter of aperture about one-twentieth of an inch.

Obtained in the equatorial Atlantic.

Described from Mr. Dana's uncoloured figure.

The form of this shell seems to be more obtusely conical than in any other species, and the alar expansions are small.

Figure 606, front view of the shell and animal, enlarged.

CLEODORA FALCATA (*Gould*).

T. elongato-conica, valdè recurva; apertura circularis. Animal alis flabellatis, obliquis, subarcuatis, iridescentibus munitus.

ANIMAL with the alar expansions large, flabellate, irregular, basal junction narrow, anterior margin undulately convex, somewhat emarginate beyond the spine, posterior margin deeply and undulately concave, one-half the length of the anterior edge, terminal margin

obliquely rounded; posterior surface covered with serratures in lines from the mouth to the margin; and along a line from the mouth to outer margin is a series of vibrating ciliæ; basal lappet short and broad, emarginate at tip. Viscera within the tube much as in the preceding species, except that the dark mass is grass-green.

SHELL very strongly recurved, forming nearly a quarter of a circle; aperture circular.

Length not over half an inch.

Taken by Mr. Dana between Oregon and the East Indies.

The extraordinary curvature of the shell is a prominent characteristic, as well as the peculiar form of the wings.

Figure 608, the shell, with the animal, enlarged.

The four following species of *Atlanta* do not belong in this group, but their affinities are with the *Gasteropoda*, and they are allied to *Janthina*. Indeed, Mr. J. E. Gray has proposed a family, including them, under the name *Janthinidæ*. The original figures were inadvertently laid aside among those of *Pteropoda*, with which they have been sometimes ranked.

ATLANTA PRIMITIA (*Gould*).

T. nautiloidea, rotundato-ovata, compressa, dextrorsum umbilicata, carinâ latâ sensim angustatâ cinctâ: spira anfractibus tribus: apertura angusta, elliptica, angulis acutis; labro arcuato; color violacea.

ANIMAL having the mouth at the extremity of a long proboscis, and at times dilating like a sucker, with a fissure or emargination at its superior side, and fringed with ciliæ in incessant motion. Eyes very large, at the distal third of the protruded body; they are vitreous, and situated on short, black peduncles; between them is a prominence, or forehead, advancing a little in front of them, on each side of which arises a fleshy, fusiform tentacle. From the base of the proboscis, on

the left side, arises an oblong membranous expansion, on the inferior margin of which, about midway, are two thin, circular lamellæ, attached obliquely. On the right side, corresponding to the membranous expansion or natatory, comes off horizontally an arm, having a spatulate extremity facing the proboscis at right angles with the arm, and furnished at the elbow with a minute spine. This seems to answer the purpose of an operculum. At the junction of the proboscis with the natatory above, is the anal orifice. Just below this, on the right side, is a bilobed, sacculate organ, communicating by a small duct with internal viscera (probably generative). The mouth connects with an ample œsophagus, to which succeeds an intestinal canal, whose course is very apparent, as far as a small, ovate body near the spire of the shell, which is the heart, and is seen to pulsate very regularly when the animal displays itself. The mantle is folded so as to form an ample collar embracing the body, and completely encloses the animal when it is withdrawn. Colour faint purplish, tinted lake-red. [J. P. C.]

The SHELL is nautiloid, ovate, very faintly umbilicate on the left side, of about three whorls; the lip of the aperture convex in profile, the aperture itself narrow elliptical, acute at extremities. It has a thin, broad, membranous carina at the angle of the shell. Colour violaceous, especially on the spire.

Obtained in the equatorial Atlantic.

This appears to be closely allied to *A. Lesueuri*, as figured in the Voyage of the Bonite, pl. 20, f. 1-15, though it differs in several respects. It was figured by Mr. Dana, and described from his figure and notes. I think it quite probable that the point at the junction of the foot and neck, considered as an anal opening, may really be the ganglion described in the next species, as seated at that part.

Figure 597, shell and animal, enlarged, with details natural size.

ATLANTA CUNICULA (*Gould*).

T. fragilissima, pellicida, nautiloidea, sub-circularis, compressa, carinâ latissimâ cincta: apertura elliptica, acutangularis.

ANIMAL of a pale-flesh colour, with a slender neck: the proboscis about as long as the neck, uniting with it at an angle of about 130° , and presenting something like an elevated forehead between the eyes. At its extremity is the mouth, which soon dilates into a large œsophagus, or stomach, from which a distinct alimentary canal passes. The eyeball is crystalline, with a dark spot like a peduncle, at the base of which lies the brain; at the junction of the natatory membrane with the neck is a nervous ganglion, from which nerves pass in various directions. The natatory membrane is elongated, tongue-shaped, covered with ciliæ; its marginal appendage, which is probably an instrument for adhesion, is kidney-shaped. The foot, or opercle, is narrow, ovate. The pulsating organ is ovate, of an ochreous colour; the viscera within the spire of the shell are convoluted and straw-coloured. Mantle conspicuous, of the same colour.

SHELL very delicate, with a keel nearly as broad as the shell itself, nearly circular, compressed, quite simple, merely exhibiting very faint lines of growth.

Obtained by Mr. Dana in latitude 28° N. long. 178° E., to the westward of the Sandwich Islands.

This animal is quite different from the preceding, and is unlike any species hitherto figured. It is described from the figures and notes of Mr. Dana. The anatomical details are well delineated.

Figure 198, the animal and shell, enlarged; 198 *a*, the head, still more enlarged; 198 *b*, the cervical ganglion and its branches; 198 *c*, natural size.

ATLANTA VIOLACEA (*Gould*).

T. nautiloidea, vix compressa, violacea, valdè carinata: anfractus quatuor sensim crescentes: apertura elliptica, angulis rotundatis.

SHELL violaceous, nautiloid, whorls four, the last volution not rapidly enlarging, and unusually distended; keel nearly as broad as the whorl at the aperture, which is elliptical, about twice as long as

broad, rounded at the extremities. Colour violaceous, deeper at the spire.

Length, including the keel, three-eighths of an inch; breadth one-twelfth of an inch.

Found in the stomach of a Bonito, taken in latitude 3° S., long. 20° W.

This is a large shell, agreeing in colour with the species first described; but it is larger, less compressed, and the aperture is quite different. Described from a figure by Mr. Drayton.

Figures 599, 599 *a*, lateral and superior views of the shell, enlarged; 599 *b*, natural size.

ATLANTA TESSELLATA (*Gould*).

T. nautiloidea, compressa, carinâ angustatâ cincta: anfractus quatuor, maculis quadratis violaceis seriatim dispositis ornati; ultimo anfractu cito crescente: apertura angusta, ad angulum internum rotundata.

SHELL nautiloid, compressed, the last whorl somewhat rapidly enlarging; whorls four, with a very narrow keel around the angle: aperture narrow, oval, rounded at the inner extremity, acute at the outer angle: colour yellowish, with a series of square, violaceous spots following around the middle of the spire.

Greatest diameter one-fourth of an inch; transverse diameter one-fortieth of an inch.

Found with the preceding.

The remarkable series of quadrate spots is a very obvious distinctive character of this species.

Figures 600, 600 *a*, two views of the shell, enlarged; 600 *b*, natural size.

TUNICATA.

CYNTHIA AMPHORA (*Gould*).

C. subglobosa, ochracea, tenuis, longitudinaliter sulcis remotis segmentata et omnimodè subtiliter corrugata. Orificia approximata, magna, labiis eversis et incrassatis.

ANIMAL sub-globose, colour ochreous, tinted orange, tunic thin, and rendered rough by short wrinkles running in all directions, surface also divided somewhat into segments by longitudinal furrows. Orifices approximate, large, remarkable for the eversion and thickening of their lip. The superior orifice is much the larger, and they both open at the end of short, thick, constricted tubes.

Height an inch and a half; circumference three or four inches.

Found abreast of Fort Santa Cruz, Rio Janeiro, in four or five fathoms of water.

Figure 609, lateral view of the animal. .

PHALLUSIA VIOLACEA (*Gould*).

P. nigro-violacea, erecta, ovato-cylindracea, coriacea, lævigata, nitida: orificia subequalia, parva, mamillas subglobosas perforantia.

ANIMAL blue-black, erect, of an ovate-cylindrical form, somewhat lobulated, of a rigid, leathery consistence, and smooth, shining surface. The orifices are very small, nearly equal in size, seated on large, rounded protuberances, one of which rises only to the base of the other.

Height two and a half inches; diameter an inch and a half.

A single specimen was taken, in three fathoms water, off the northern point of the entrance to the harbour of Rio Janeiro. [J. P. C.]

Figure 610, lateral view of the animal.

ASCIDIA MONSTRANS.

P. subglobosa, sursum porrecta et versus aperturam buccalem sensim angustata: apertura excretoria parva, valdè inferior: tunica tenuis, lævis, ex olivaceo aurantiaca demum sanguinea: labiis simplicibus, ciliatis.

ANIMAL small, subglobose at base, and produced towards the respiratory orifice in a long, tapering tube; the excretory orifice is very small, and seated far below the other, on a slight mammillation. The tunic is thin, smooth, coriaceous, passing from olive-green at the base, through deep-orange to vermilion at the orifices; lips of the orifices simple, furnished with long, delicate ciliæ, continually in motion.

Height sometimes one inch; diameter about two-thirds the height.

Obtained near the entrance of the harbour of Rio Janeiro, in three fathoms water, attached to old shells, &c. *Couthouy*.

Figure 611, group of animals of different size.

BOLTENIA COACTA (*Gould*).

B. ovata, rigida, lanata, longitudinaliter rugosa, ochraceo-olivacea, posticè pedunculata: aperturæ subterminales, remotæ, cruciatæ, inermes, intus rosaceæ, mamillas obtruncantes.

ANIMAL ovate, drawn out on one side into a peduncle of an inch and a half long, which terminates in a small, narrow, coriaceous, inflexible base. This peduncle is quite slender at its lower part, and

suddenly dilates as it approaches the body, which floats nearly at a right angle with it; and this portion, together with the whole sac, is strongly marked by deep, longitudinal wrinkles. The apertures are remote, shaped like the ace of clubs, on the summit of a prominent mammilla near each extremity; internally they are deep lake-red. External colour dirty ochre, deepest in the furrows. The tunic is very thick and rigid, with a slight cretaceous feel to the knife, and covered with a short, stiff pubescence, much resembling hatter's *felt*. It is but slightly contractile, though the orifices may be so contracted as to disappear entirely.

Length of the sac two and a half inches; diameter just above peduncle one and a half inches.

Dredged in sixteen fathoms, Orange Harbour. [J. P. C.]

Figures 612, 612 *a*, two views of the animal.

In addition to the above are several carefully-drawn figures of the aggregated Tunicata, with brief notes by Mr. Dana. Among them are specimens of Botryllus, Polyclinum, Eucœlium, and some curious forms, which are not yet given in zoological works, so far as can be ascertained. As it is impossible to describe such animals from figures alone, with any tolerable degree of accuracy, the few notes respecting them will be reserved, and added to the explanations of the figures in the Atlas. Every carefully-delineated figure of these obscure forms will be valuable, in the attempts at systematic arrangement which must hereafter be made.

Page 174. *TURBO LACINIATUS*. A series of specimens, recently brought from New Caledonia, has shown that the specimen here described is a very young one. The shell grows to be quite large and massive, some measuring as much as three by two and a half inches. Sometimes the row of spines is double, the lower ones being smaller and more numerous than the upper. In older specimens the columella loses its rosy tint; the columellar tooth becomes a smooth undulation; the inner and transverse lips advance, so that the aperture becomes remarkably hopper-shaped.

Page 184. *TROCHUS TANTILLUS*. *Margarita angulata*, A. Adams, Ann. and Mag. of Nat. History, Sep. 1853, seems to be the same shell.

Page 185. *TROCHUS LIGATUS*. Prof. E. Forbes has given a description of this in the Proceedings of the Zool. Society for 1850, p. 271, under the name of *Trochus castaneus*, Nuttall, MS. In fresh specimens, there is a violet band just in front of the suture.

Page 196. *LITIOPA DECUSSATA*. The figure referred to should be 252, instead of 232.

Page 211. *NATICA LEWISII*. This noble shell has since been described as *N. herculea*, Middendorf, Beitrage zur einer Malacol. Rossica (1849), ii. 96, pl. 7, figs. 5, 6, 7.

Page 218. There should have been inserted a reference to the undetermined species of *Pyramidella*, probably *Obeliscus terebelloides*, A. Adams, delineated on account of the animal, at Figure 262.

Page 219. *TRICHOTROPIS PUSILLA* should precede *T. cancellata*, having been accidentally omitted. The following description is copied from the Proceedings of the Boston Society of Natural History, iii. 197 (Apr. 1850). "T. minuta, rhomboideâ, umbilico semicirculari perforatâ, albidâ, striis minutis volventibus cinctâ; spirâ conicâ, anfractibus 4-5 convexis, ultimo ventricoso et costis elevatis tribus cincto; aperturâ semicirculari; columellâ rectâ, ad planitiem labri acuti trilobati haud assurgente; umbilico semicirculari. Axis $\frac{1}{2}$ poll. *Habitat*, crevices of rocks beaten by surf, at Fishtown, Liberia.

"This curious little shell was also collected by the Exploring Expedition, probably at the Cape de Verd Islands. No hairy epidermal processes appear on any of the specimens; yet I cannot doubt that

it belongs to the genus where I have placed it." Is it the Fossar of Adanson?

Figures 274, 274 *a*, ventral and dorsal views of the shell, much enlarged; 274 *b*, natural size.

Page 241. The three following species have unfortunately been omitted in the text, the copy having accidentally been overlooked.

TRITON BRASILIANUM.

Testa rhomboidea, elongata, rufescens, epidermide tenui longitudinaliter hic illic fimbriato induta: spira conico-turrita, anfractibus sex tabulatis, supernis costis quadratis duabus ad apicem granulatis cinctis; anfractu ultimo triangulari costis sex undato-nodosis antrorsum diminuentibus cincto, in rostrum vix recurvum producto: apertura dimidiam long. testæ æquans, ovato-lunata; labro valdè varicoso, costis supereuntibus, interspatiis fuscis, plicis geminatis albis munitis; columellâ castaneâ rugis albis obliquis ornatâ.

Triton Brasilianum, GOULD; Proc. Bost. Soc. Nat. Hist., iii. 142. May 1849. Expedition Shells, 65.

ANIMAL with the foot oblong-oval; head broad, depressed, separated by a fissure from the foot; proboscis short, hardly projecting beyond the head; tentacles stout, conical, compressed; eyes on a considerable enlargement, about half way up on the outside, siphon protruding but slightly beyond the shell. Body, head, siphon, &c., of a fine reddish-brown colour, passing to yellowish towards the margin of the foot, and ornamented with numerous circular or oval black spots, surrounded by a narrow circle of bright gold colour; the spots are larger and sparser on the posterior portion of the foot than elsewhere; under side of foot granular, greenish yellow, with scattered black dots sprinkled over it, its edge finely ocellated like the body. Motions sluggish.

SHELL of medium size, rather light, elongated, ovate-fusiform, turreted; spire conical, with about six whorls, the upper ones cylindrical, with a broad, slightly excavated shoulder to each of them, encircled with two elevated square ribs, gradually diminishing to the apex,

and on the uppermost whorls these are barred by distant longitudinal threads, so as to form beads at the points of intersection, and disappear on the penultimate whorl. The last whorl is ventricose, with a siphonal beak constituting about one-third its length; on this whorl are six revolving ribs, the upper ones the largest, and undate nodose, rendering the whorl angular behind; they gradually diminish in size, until they become mere threads anteriorly; the interspaces are concavely excavated, not clathrate. Aperture a little more than half the length of the shell, lunate ovate; outer lip regularly arched and fortified by a large rounded varix, over which the ribs run to the edge of the aperture; on the inside of the lip, which is dark chestnut-coloured, between each of the ribs, is a double plicate denticle; inner lip arched centrally, chestnut-coloured, variegated with irregular white wrinkles, and also with one or two white lamina posteriorly. Beak slightly recurved; colour, shades of purple brown; the varix about equally checked with three white and three brown portions. In the fresh state it is covered with a thin, fibrous, fawn-coloured epidermis, which at intervals of about a quarter of an inch rises into a fibrous or capillary fringe.

Length two inches; breadth an inch and a half. Found on rocks at low water, in the outer harbour, Rio Janeiro.

I have been rather minute in the description, as the shell appears to be one of several which have been included in the Linnean *T. doliarium*. Deshayes has indicated it to be a distinct species, but has not described it. The colouring is like that of *T. doliarium* or *succinctum*, but the more angular form and the cincture is like *T. cutaceum*; from this it differs in colour, and in the form and denticulations of the lip. The aperture and peristome resemble *T. pileare* in form and sculpture, though the sculpture and colouring of the outer lip is different. It is intermediate between *T. pileare* and *T. cutaceum*.

Figure 296, the shell, a small specimen; 296 *a*, animal and shell, as in crawling; 296 *b*, foot of the animal, with the shell.

TRITON MUNDUM.

Testa parva, solida, oblongo-rhomboidea, straminea, epidermide tenui, sparsim hirsuto induta: spira conica, anfractibus quatuor, convexiusculis, ultimo gibboso, tri-nodoso, in rostrum rectiusculum attenuato, costulis tribus et liris intermedianis cincto et filis continuis longitudinalibus decussato: apertura angusta, ovalis, dimidium testæ adequans; labro crasso, tuberculis geminatis septem crenato; columellâ arcuatâ, posticè dentiferâ; fauce albo.

Triton mundum, GOULD; Proc. Bost. Soc. Nat. Hist., iii. 143. May 1849. Expedition Shells, 66.

ANIMAL pale cream colour, with a few marginal dots; head, tentacles, and siphon minutely ocellate; foot very small.

SHELL small, solid, dingy white, of an oblong, subrhomboidal form, covered with a thin, fibrous, pale yellow epidermis, bearing scattered hairs. The back of the last whorl has three longitudinally compressed nodose folds, considerably elevated, so as to render the back gibbous; varices (one on each whorl) well developed, broad, elevated, undermined posteriorly: surface girdled by equidistant slender ribs, three on the upper and six on the anterior whorl, between each of which are three fine, raised lines, of which the middle one is the largest; there are also threads around the beak; every portion is sculptured with raised, approximate, longitudinal threads, which cross alike all the elevations and depressions, rendering the whole surface reticulate and granular. Whorls four, but when the apex is entire there are three smooth, hyaline, additional ones, moderately convex, with a well-impressed suture, the anterior one suddenly contracting to a short, direct, very slightly recurved beak. Aperture nearly half the length of the shell, narrow oval, acute at extremes; outer lip with seven bifid, tubercular scollops, which are prolonged towards the fauces; pillar moderately arched, with a prominent ridge-tooth posteriorly, and with smaller ridges throughout. Whole aperture clear white.

Length seven-eighths of an inch; breadth two-fifths of an inch.

Inhabits Tutuila, Samoa Islands.

This might be regarded as the young of *T. nodosum*; but besides bearing all the marks of maturity, it is more slender, the longitudinal lines are stronger, and the lip is white.

Figure 297, the shell, enlarged; 297 *a*, the animal, with the shell, as in progression; 297 *b*, plantar view of the same.

PHOS VARICOSUS.

Testa elongata, lanceolata, fulvida, rubiginoso-cincta, costis lamellosis ad sexdecem clathrata, quorum ad tribus in singulis anfractibus, variciformibus, pallidioribus, interspatiis duplo latioribus, concavis et lineis incrementi striatis, omnibus filis volventibus retrorsum acclinatis decussatis: spira turrita, anfractibus novem vel decem superne turgidis: apertura angusta, lunata, posticè rotundata trientem longitudinis testæ adequans; labro simplici, intus sulcato, rosacco; columellâ quadruplicatâ; canali siphonali brevi.

Phos varicosus; Proc. Bost. Soc. Nat. Hist., iii. 143. May 1849. Expedition Shells, 66.

SHELL elongated, lanceolate, pale fawn-colour girdled with ferruginous, barred with about sixteen compressed ribs, about three of which on each whorl are thickened into pale varices; the spaces between these are about twice the width of the varices, with elevated lines of growth, decussated by revolving lines, which incline backwards; spire turreted, whorls nine or ten, turgid posteriorly; aperture narrow, lunate, rounded posteriorly, about one-third as long as the shell; lip simple, sulcated within, rose-coloured; columella four-plaited; siphonal canal short.

Length an inch and an eighth; breadth nine-twentieths of an inch.

Inhabits the Philippine Islands.

This curious shell is somewhat anomalous, having the varicose spire of a *Triton*, but the unequivocal aperture of *Phos*. It may be com-

pared with *P. retecosus*, Hinds, having the more slender form and finer reticulation, but with the peculiar varicose lip, and nearly the same size and colour. It is, perhaps, still more like *P. senticosus*, but it is much less asperous, and peculiarly inflated near the suture.

Figure 360, ventral, and 360 *a*, dorsal view of the shell.

Page 247. *RICINULA TUBERCULATA*. Refer to Figure 305, shell, with the animal, as in crawling; 305 *a*, plantar view of the animal and shell.

Page 256. *BUCCINUM FARINOSUM*. The reference should be to Figure 323, instead of 313.

Page 274. *MITRA CAPILLATA*. Reference should be made to Figure 351.

Page 290. *PERONIA INDOLENS*. Reference to Figure 382 has been omitted.

Page 299. Third line from top, for "dorsal" read "ventral."

Page 307. Six lines from bottom, for "lateral" read "dorsal."

Page 314. Nine lines from top, for "valves" read "areas."

Page 331. *CHITON LIGNOSUS*. For "Middendorff" read "Wosnes-senski," and refer to Figure 424.

Page 338. At bottom, for "449" read "439."

Page 394. *MACTRA DEBILIS*. The specimen was accidentally crushed, and the figure necessarily omitted.

Page 395. *LUTRARIA MAXIMA*. As this name was previously given to a fossil species by Jonas (Menke's Zeitschrift, March 1844, p. 34), the name given by me, *L. capax*, will stand.

Page 412. *DONAX CROCATUS*. Specimens lost, and therefore not engraved.

Page 419. *VENUS TOREUMA* is probably *V. crebrisulca*, as given by Sowerby, Thes. Conch., f. 187-9.

Page 430. *UNIO DORSUOSUS*. The shell recently described by Mr. Conrad under the name of *U. Naupaeensis* (Journ. Acad. Nat. Sciences, ii. 296, pl. 26, f. 4), seems to be identical with this.

Page 462. *GAIMARDIA TRAPESINA*. In Mr. Gray's Synopsis of the Genera of Shells in the British Museum (1840), he indicates the genus *Modiolarca* without description, naming this shell as the type, associating it with *Crenella* to form the family *Crenellidæ*. Subsequent comparison showed it to be incompatible with this arrangement, which led Mr. Gray to give, in the Proceedings of the Zoological Society for April 1854, the anatomical characters of the animal, and to institute the family *Modiolarcadæ*. In a note to this description he alludes to the description previously made in this volume, which is in fact much more in detail than his own. Whether, with this mere indication of a name for the genus, without any specified characters, and its erroneous association, his name is to obtain, instead of that in which the anatomical characters were first given, I must leave to the candor of conchologists at large.

Page 464. *OSTREA DISCOIDEA*. By some chance a wrong shell seems to have been figured at 578.

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